

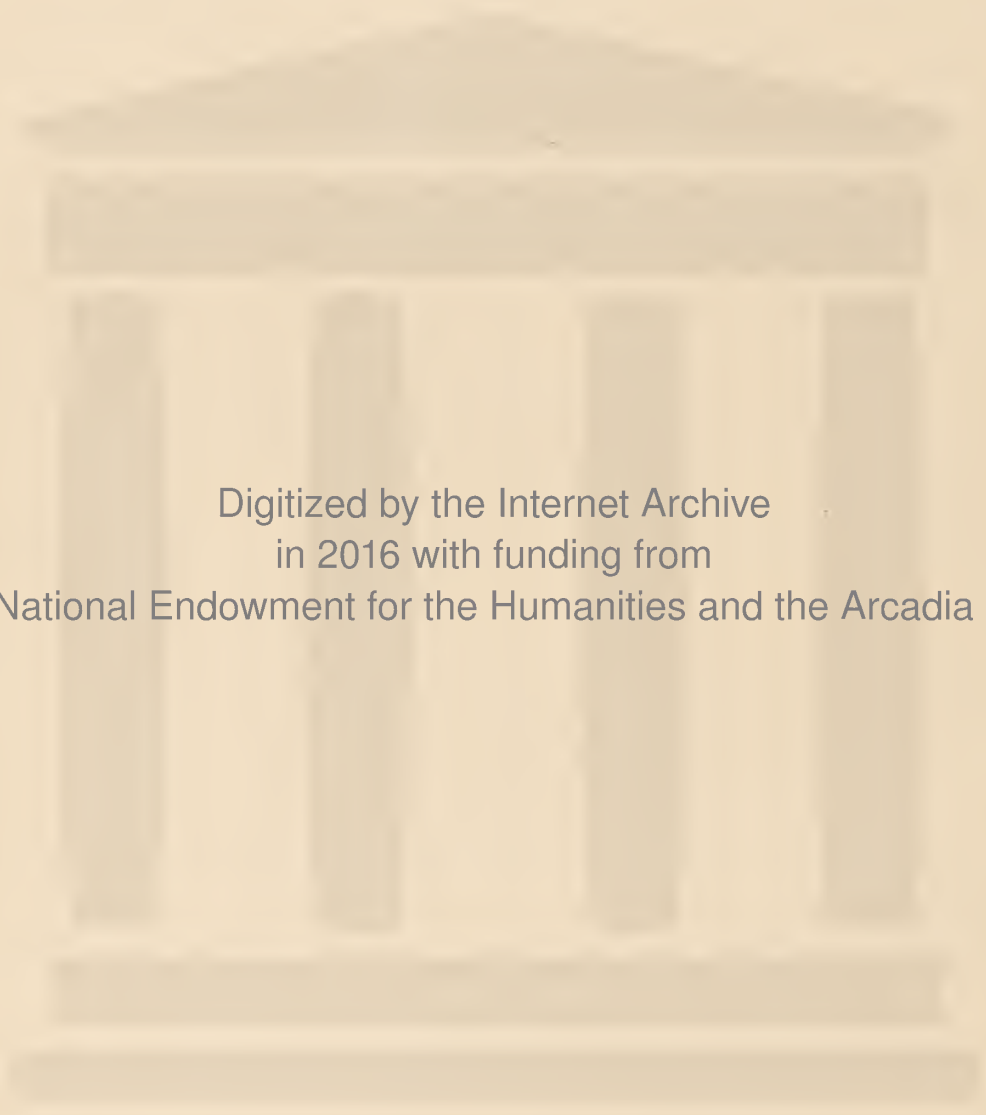
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Consultant

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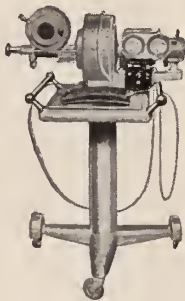
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Medical Director

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EDITORIAL

THE SOUTHERN

The recent annual meeting of the Southern Medical Association at Asheville, North Carolina was, as usual, delightful on the social, and highly profitable on the scientific side. Science knows no sections, but scientists who get together at these annual conferences, who have been accustomed to think from the viewpoint of the same historic background, who speak the same lingo, who face common problems, find themselves bound in a closer and more understanding organization than is possible where the group is more cosmopolitan. There are certain advantages in these modern days of quicker communication and shortened distance, in knowing the attitude of other nations toward the progress we are making in our particular line of work. One never knows too much, or, even, enough, but the medical profession of the South has distinct problems of its own in addition to those of the more temperate climes; it is, therefore, well for us to assemble together annually in the Southern Medical Association, devoted, as it is, purely to the art and science of medicine, and compare notes as to methods and progress. In addition, it is well for as many of us as possible to go to the larger meetings of the American Medical Association and for those who devote themselves to special branches of practice to their own distinct organizations.

It is equally important for Kentucky physicians to be readers of the SOUTHERN MEDICAL JOURNAL. Excepting our own JOURNAL, there is no other publication so filled with material of practical everyday benefit for a man practicing medicine in any of its branches in these southern states. No other state except North Carolina had more members registered in attendance than Kentucky. We hope to bring the 1930 meeting to Louisville. Kentucky has now enjoyed the hospitality of the other cities of the southland for a decade since we have had the privilege of showing our southern friends how we appreciate it and them.

THE JOURNAL congratulates President Bathurst and Secretary Loranz on the unusually complete arrangements which were made for those in attendance at the Asheville session.

BUYING HEALTH

There is probably no more widely read nor more influential publication than the SATURDAY EVENING POST. From a recent editorial, under the above caption, we are publishing an extended quotation so that our readers may be familiar with the arguments that are being generally circulated to the thoughtful reading public of the country in regard to health department organization.

It is of particular interest to Kentucky that thirty-eight, a little more than ten per cent of all the full time health departments in the United States, are in this Commonwealth.

The quotation from the Saturday Evening Post follows:

"Students have been urging for some time the consolidation of small, outworn units of government into larger districts more adapted to meet modern conditions. This is especially applicable to health work, and anyone who despairs of his country should inquire into the recent progress in coordinating health activities in rural sections. Here is concrete evidence that we are learning how to govern ourselves. In 1911 there were no full-time rural health departments in the United States, while on January 1, 1928, three hundred and thirty county health units were in existence. There is well-grounded fear on the part of the citizens of being oversupervised and overtaxed. But in health work, in any case, not only greater efficiency but actual dollars and cents economy results from a sensible coordination of effort.

The natural advantages which rural sections possess in matters of health are more than offset by the better health protection afforded the city dweller. For years the decline in the death rate has been greater among the urban than among the rural population. The United States Public Health Service says that in our rural communities there are a million people incapacitated all the time by illness, much of which is preventable; about 70 per cent of the school children are handicapped by physical defects; and more than 60 per cent of the people between forty and sixty are in serious need of physical repair. Malaria, hookworm, typhoid and dysentery are far more common in the country than in the city; the first two being entirely rural. Tuberculosis is surprisingly prevalent in the country. Under modern conditions of trans-

portation and travel, rural and urban health conditions are closely related. The typhoid epidemic in one of the large cities of the North American continent a few years ago furnished, as an official report says, 'a dreadful example of the relationships of insanitary rural conditions to urban health.'

But rural districts are poor and heavily burdened. County commissioners and local medical practitioners are periodically aroused and pestered by campaigns in the interest of some particular health problem. Too many specialties in the way of health activities are wished upon poor communities. The general public is confused and the medical profession irritated. The need is for coordination, for the pooling of resources to attack the whole complex and interrelated problem of health and disease.

Recognition of these facts is resulting in the county full-time health unit, with a single definite program of local, state and Federal work. Under the operation of one such unit, in a Western state, all the cities as well as the rural sections of the county have coordinated their health work in one movement, under one head and with one appropriation. From 1922 to 1927 the typhoid and diphtheria death rate had dropped from 16.2 to 19.5 per 100,000 to 2.9 each. The infant and maternal death rates had fallen from 73.7 and 20.6 per 1000 living births to 61.7 and 6.7, and the death rate for infants under two years from enteritis and similar complaints fell from 33.3 to 10.7 per 100,000 population. The economic saving from a reduced death rate naturally exceeded the cost of the health work several times, and such activity would have been less effective if carried on by each separate local unit. The county is naturally proud of the officer in charge, but the citizens of the county should give themselves credit for having the common sense to pool and centralize their efforts.

It must not be supposed that official health agencies are to take the place of the practicing physician. These agencies, as pointed out by Dr. W. F. Draper, assistant surgeon general of the United States Public Health Service, are concerned with things and conditions over which the individual has no control; they 'seek to create a favorable environment in which the individual may carry out the instructions of his physician—his personal health adviser.'

But while official or public agencies are not intended to take the place of the practicing physician, the individual practitioner would be about as useful as a Central African witch doctor if there were no official agencies. It is a trite but valuable saying that public health is purchasable. But money alone will not

buy it. Money will not stop an epidemic of typhoid or bubonic plague. Careful official organization is requisite, and this should be adapted to modern conditions.'

OUR TUBERCULOSIS PROBLEM

The major public health problem confronting the medical profession of Kentucky may well be approached through consideration of the disease which continues to cause more deaths than any other, namely, tuberculosis.

It may be considered in three divisions: the prevention of the disease, its arrest in those who come under the care of the physician or the sanatorium during the early stages, and the care of the advanced case.

The reduction of the death rate of something more than 50 per cent, which has occurred in Kentucky since 1911, has been brought about almost entirely, outside of Jefferson and Fayette Counties, by better health education methods in the schools and in the care of infants and pre-school children. In Louisville and Lexington further contributions to the decreased death rate have been made by the splendidly conducted county sanatoria under the leadership of Doctors Miller and Murray. It is a well recognized fact that every advanced case of tuberculosis taken into a sanatorium and thereby removed from contact, particularly with young children, is an important contribution to the prevention of the spread of this infection. The effective work of the State Live Stock Sanitary Board in eliminating tubercular milk cows has been another great contributing factor, especially in the reduction of the death rate in infants and young children. It is of particular interest that the sick and death rates from tuberculosis have been reduced far more rapidly in the counties having full time health departments than in the other counties of the state.

The treatment of early cases is almost completely dependent upon education. It is only recently that physicians have given the patients the systematic and thorough examination that recognizes this disease in its incipient stage when it responds most readily to treatment. It was formerly the custom to hastily prescribe tonics or alteratives in the incipient stage, and too frequently the physician was as much surprised as the patient was discouraged when it eventually developed that the case was one of tuberculosis. It is now the recognized duty of the physician to thoroughly examine the chest in every patient who presents any of the elusive symptoms of this insidious disease.

Leadership in the campaign against tuberculosis has been wisely furnished by the Kentucky Tuberculosis Association in the past

year, in cooperation with the county medical societies and county health departments. Diagnostic clinics have been held in thirty-six counties. Most of those examined were known contacts with active cases of tuberculosis. This campaign has been largely financed by the sale of the Christmas Seals and the result secured has cost as little as any other public health activity with which we have ever been acquainted.

The care of the advanced case presents many problems. This is particularly true in a state like Kentucky where unfortunate political influences have created a very large number of poor counties. Many of these counties have such meagre incomes that they are unable to attack successfully any of their problems whose solution costs any money. Here again the leadership of the Kentucky Tuberculosis Association has been especially effective, in the past few years. More than 300 patients are now getting well in open air shacks and sleeping porches that have been built upon the advice of this organization. The excellent results secured in Louisville and Lexington by the Sanatoria indicates the necessity for more liberal appropriation for beds for the tubercular and an enlarged state institution. The State Tuberculosis Sanatorium at Hazelwood, near Louisville, is splendidly and economically conducted, but is only available for patients who can pay \$15.00 per week, from which it derives its support.

These observations have occurred to us following a splendid meeting of the Jefferson County Medical Society, at which the principal address was delivered by Doctor Chadwick of Massachusetts, one of the recognized leaders of the anti-tuberculosis movement in the United States. Doctor Chadwick was brought to Louisville by the Louisville Tuberculosis Association and the whole state will profit by his wise advice. It is a pleasure to reproduce an editorial from the *Herald-Post* of November 22nd on this subject.

"CURING TUBERCULOSIS."

"While the intricacies of the legislation concerning Kentucky tuberculosis sanatoria are being unraveled by the Court of Appeals it is encouraging to note the progress which has been made in the State in lowering the death rate from tuberculosis.

"The statement of Dr. A. T. McCormack that the Kentucky toll from the White Plague has been reduced by one-half since 1911 can be supported by official statistics. The Kentucky death rate from this source in 1911 was 230.9 for each 100,000. It has come down to 108 in 1927. Here in Jefferson county for the corresponding periods the percentage has dropped from 244 to 118.

These figures agree substantially with the progress reported in Massachusetts.

"Evidently the work of those fighting tuberculosis in Kentucky has been effective. And it should apparently follow that if so much has been accomplished in the last ten years more can be hoped for in the future.

"One of the worst features of the disease in the past has been the belief of the afflicted that once stricken there was no hope. Such a mental attitude made it all the harder to recover. Work was given up, family support was dislocated, heavy and unprofitable financial burdens were accumulated.

"People can and do recover from tuberculosis. Food, sunshine and adequate rest are the most important elements in a cure."

ORIGINAL ARTICLES

THE TREATMENT OF FRACTURES WITHOUT SPLINTS.*

By G. A. HENDON, M. D., Louisville.

When reason agrees with experience it is superfluous, when it opposes experience it is false.—Robert Boyle.

Located somewhere in every mental dominion is a sanctuary in which certain idols have been erected and at whose shrines sacrifices and obeisances are made at certain intervals under certain circumstances. We of the medical profession have our household gods before whom we bend the knee and send up our petitions and fortify against encroachment with our most strenuous effort. At the head of this Olympic faculty, I would place Orthodoxy as the presiding Deity.

Anything that is proposed must have the sanction of this god head before it becomes worthy of serious consideration. The theme I shall present upon this occasion is submitted entirely upon its own unaided merit. Supported only by experience and recorded observation, but without the seal of the god orthodoxy.

This method of treatment for fractures has engaged my thoughtful attention and experimental efforts since 1920. In order to avoid any useless discussions regarding priority, I wish to disclaim any such attributes for myself so far as the use of animal bone for the fixation of fractures are concerned. This substance has been used for this purpose since prehistoric times. So was soap and water for washing the hands long before Lawson Tait showed us how to apply it in surgery and we called it asepsis and it opened the door to the most sacred precincts of the body. It is often the use of old things in a new way that pro-

*Read before the Surgical Section of the Kentucky State Medical Association at Richmond, Sept. 10-12, 1928.

duce the most valuable and important results. I wish it to be made clear that the device that I employ lays no claim to the exalted social distinction now enjoyed by the Craft family. It is neither Homer nor Hetty nor Arthur. I am pleased to call it a Key because with it I can lock the fragments of broken bones so that under ordinary circumstances no other means of fixation is required. It is only for insane and delirious patients that additional means of restraint are needed.

The work in this field had to be slow and tedious because controls could not be obtained by the use of lower animal. It is well known that animals can not be depended upon for fracture experiments on account of the difficulty in restraining them for a sufficient length of time to secure uniform results.

I began this work by using cases in which other methods failed and always met with success. This experience led to the logical conclusion that a measure that would always succeed under the most unfavorable circumstances must surely be reliable in cases where the surroundings were more favorable. This has proven in practice to be true. I have subjected my operation to the severest tests possible, having used it without failure in all types of fracture (except pathological fracture). I am prepared to answer any criticism, in fact I court criticism. All I ask of my critics is that they treat the subject with respectful consideration. I feel sure I can furnish any proof or supply any material evidence that may be desired. I have been able to accomplish things that I could not believe possible until they had been done and presented as visible physical results, that would admit of no denial. For instances in one case, two inches of the middle of the shaft of the femur was sacrificed and a key was substituted with the result that recovery took place with 1-2 inch of shortening.

A case in which three inches of the distal end of the radius was compensated by a key with restoration of function of the hand but stiffness of the wrist. Five gunshot fractures, three of my own and two by other surgeons. One by Dr. Murphy Howard of Harlan and one by Dr. L. S. Siler of Corbin.

One case of non union of the femur shaft, one and one-half years duration in which two unsuccessful operations had been tried. One case done by Dr. Allen Kirk, fracture of the tibia of two years' duration with complete restoration of function. There has been twelve fractures of the femoral neck in old people without a failure. In all there has been sixty cases of fractures of various kinds treated by this method.

In one case a fracture of the femur in a boy nine years old, serious infection of the soft parts occurred on account of a grave

rupture of technique in the operating room. The wound discharged for a year but complete bony union was accomplished in the usual time without shortening or other deformity and perfect function in the limb.

My most serious mishap occurred in a patient with fracture of the tibia. The key was used, the bone united promptly but the soft parts refused to heal. After numerous examinations sugar was found in the urine and 149 mg. to the cc. of blood. She is now under appropriate diabetic treatment and the wound is healing.

It is certainly remarkable how promptly bony union occurs and I think it is due to the unhampered circulation in the soft parts. It seems from recent investigations that nutrition for the restoration of bone is supplied chiefly from the adjacent soft structures. There is a popular idea that a certain amount of movement is good for a fracture which is equivalent to saying that a certain amount of flaccid is good for a dog. One is as logical as the other. The reason bones sometimes begin to acquire union only after motion is permitted is that the external restraints have been loosened and circulation in the adjacent soft structures is enhanced.

One has only to glance at a limb that has been entombed in a sepulcher of splints or plaster a period of eight to twelve weeks to gain a knowledge of its impoverished condition and become correspondingly impressed thereby.

My experience with the bone key taught me that it is as imperative to adopt the open method of treating gunshot wounds of the bones as it is for gunshot wounds of the abdomen. The rule that has been adopted as in all cases is to insert the key at right angles to the long axis of the line of fracture. The one exception being the tibia. In fractures involving that bone the key should always be carried in parallel to the long axis of the bone. That means always using the Medullary Canal.

The keys are made of the cortex of beef bone and vary in length from four to six inches and from two-eighths to five-eighths of an inch in diameter. I formerly used round keys but I now use them made cubical. They hold better and a small space is left on each of the four sides to relax tension and afford better nutrition.

When the key is inserted horizontal to the long axis of the limb, one-half to one inch should be allowed to protrude on each side. This prevents any chance of the fragments slipping over the end of key. If it projects an inch no fear need be felt regarding the security of the position. The question naturally arises what becomes of these keys. My answer is that they remain where they are

placed. I have one x-ray taken six and one-half years after its insertion and it has undergone no change that is perceptible. One thing I do know that in the case which became infected the key remained unaffected by the suppurative process and was extruded one year after its insertion perfectly clean white as can be seen by inspecting the specimen itself.

In fractures of the humerus if the key is used the only restraint ever employed is a sling for the forearm and this can be dispensed with if more comfort can be acquired which I have known to be the case.

In fracture of the tibia if the key is used the patient may be allowed out of bed and on crutches as soon as the surgeon is satisfied that no suppuration is impending. The same rule applies to fracture of the femoral neck and shaft of the femur. I do not use the key in fracture of the forearm unless there is some special indication like non-union or impossible retention.

The keys are made for me by H. C. Tafel, 319 Third Street, Louisville.

I think the manner of closure of the soft parts is very important. I never use any catgut, but rely entirely on silkworm gut carried through all the divided tissues down to the bones. Between each of these deep sutures after they are tied is placed one more superficial to approximate the skin margins. I have never used a drain nor have I ever found it necessary to ligate a vessel. We have never had any suppuration.

Wounding of blood vessels can be avoided by dissecting carefully and bluntly between muscular planes. I am convinced by my experience in this work that infection with its consequent evils is no more to be dreaded in conjunction with bone injuries and operations than in any other part of the body. The cause of the apparent liability to disaster lies in the devitalizing effects exerted by the immobilizing and restraining encumbrances that are usually employed. Not only do they entail the crushing impost of weight but there is added the serious embarrassment of capillary circulation and the trophic nerve supply. With a burden such as this the tissues have no reserve to resist the invasion of bacteria and readily succumb when the attack is made.



Eman—October 11, 1928, age 3 years, City Hospital. Fracture left femur, before operation.



Eman—October 22, 1928. After operation. Key in position. No motion could be felt at site of fracture. Eleven days after operation.



Bradley—Oct. 9, 1928. C. H. Fracture, left femur middle third, age of patient 16 years.



Bradley—Oct. 15, 1928. City Hospital. A P view after operation. No motion could be elicited two weeks after operation.



Farmer—Sept. 34, 1927. Sta. Comminuted fracture Rt. Lib. before operation.



Bradley—Oct. 15, 1928. C. H. Lateral view after operation. Patient walking on crutches three weeks after operation.



Farmer—Nov. 26, 1927. After operation, key in position in Medullary canal. Walking with crutches three weeks after operation... Key transfixes middle fragment which was entirely separated.



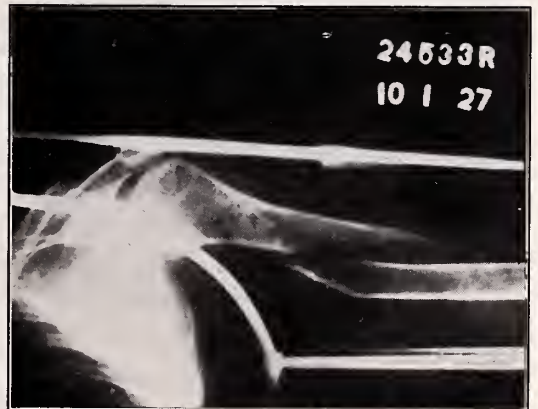
John—Sept. 24, 1928. Age 69 years. Fracture Rt. femoral neck. Patient in alcoholic delirium. Injury sustained two weeks previous.



Mrs. ——— April 23, 1928. After operation showing two keys in Medullary canal and projecting against glenoid cavity. No dressing used except sling to support forearm, complete restoration of function.



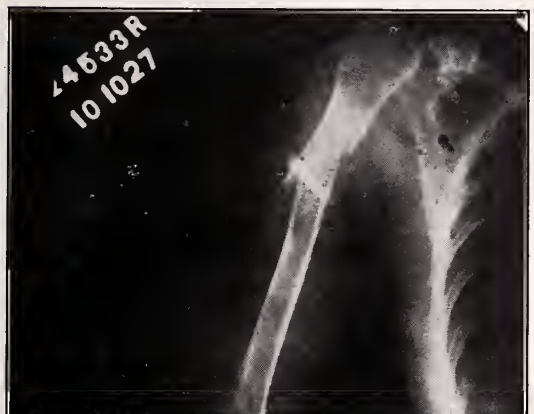
John—Oct. 10, 1928. After operation patient delirious a week, getting out of bed and walking about the ward on the night of the third day after operation. Three weeks after operation patient sat in chair and crossed his legs.



Mrs. ——— Oct. 1, 1927. Fracture of left humerus in Thomas Splint which was discarded as soon as the patient was seen.



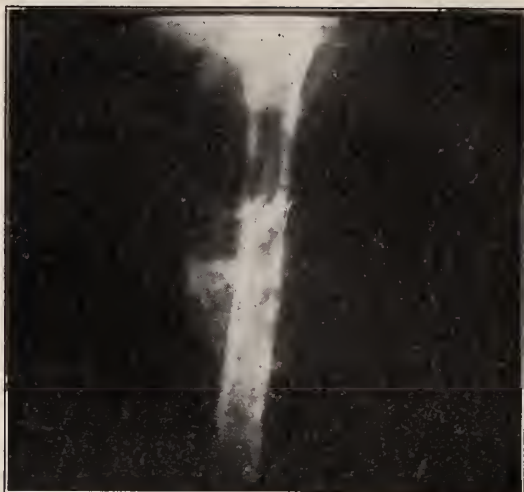
Mrs. ——— April 7, 1928. Fracture surgical neck of right humerus, three weeks previous. Age of patient 60 years.



Mrs. ———, Oct. 10, 1927. After operation showing key in position. After one year there is complete anatomical and functional results.



Mrs. R.— Oct. 19, 1927. Showing type and extent of dressing used in all arm fractures. Age of patient 65 years.



Lateral view: After operation, showing position of fragments in perfect alignment.



After operation, one week, showing key in transverse position A P view.



Fracture of left femur. The longest oblique fracture I ever saw. Patient 11 years old.



Aug. 31, 1924. Twelve weeks after operation, complete anatomical and functional results.



Aug. 31, 1924. Twelve weeks after operation. Side view. No external immobilizing apparatus was used by me in any of this group of cases, herewith reported.



Aug. 31, 1924. Front view. Twelve weeks after operation. A little more than 4 years has now elapsed with normal growth and function both maintained without any sign of trouble.

DISCUSSION

Frank P. Strickler, Louisville: I think Dr. Hendon has presented a paper that is well worth while and very instructive, especially in this day of industrial surgery, automobile accidents and traumatic surgery generally. We will see more and more of this type of surgery as time goes on.

I had my training in bone and joint surgery with Dr. Royal Whitman, and it goes without saying that I was duly brought up on all kinds of splints and plaster of Paris, for which I have the utmost respect, and when I first saw Dr. Hendon doing this work, I didn't know just exactly how to take it. I didn't know how he was going to get over with it.

I have seen a large number of cases he has done, and I think the results speak for themselves, and it positively demonstrates the fact that fractures can be treated very successfully without splints.

The reasons for Dr. Hendon's success in my opinion are first, he closes his incisions with no catgut in the wound, using silkworm-gut down to the bone and securing his hemostasis in this manner.

I am well aware of the fact that there has been a lot of criticism of intramedullary grafts from various sources, but the criticism of this type of graft has been on the round graft, the statement being made that the graft impinged on the endosteum and inhibited union. Dr. Hendon, using a special type of beef bone key which is square, only touches the endosteum in four places and could not possibly in any way interfere with union, so far as the endosteum is concerned.

Another reason for Dr. Hendon's success in my opinion, is the size of his key. He uses a key much larger than any that has hitherto been used by any operator employing this type of technique.

Another remarkable thing in Dr. Hendon's cases is the short period of convalescence. I have seen quite a number of the hip cases that Dr. Hendon has done at St. Anthony's Hospital. The average treatment of the fracture of the neck of the femur by the Whitman method requires anywhere from eight to twelve weeks and these patients require almost a year to completely recover a normal motion in the hip. I have seen these cases of Dr. Hendon's out of bed in three weeks in a wheel chair and walking in four weeks. If you take patients eighty-six years old and put them up in a Whitman spica, or any other treatment, for that matter, here is a danger of hypostatic pneumonia. The sooner you get your patients up and walking, you do away with that complication.

I think these facts that I have mentioned are the main features of the operation and that Dr. Hendon is to be congratulated on them. If anybody doubts that he has the results, he can show

them to you. The treatment of fractures is not a closed book by any means, and we cannot afford to stop in one place and do without further progress. Dr. Hendon has certainly made a step forward and a definite progress in the treatment of fractures.

C. C. Garr, Lexington: I have enjoyed Dr. Hendon's presentation very much. I have belonged to that old-time school of "the graft age", as he calls it, but I have a very keen admiration for the man who will step into new fields and try to solve problems that those of us who have used external fixation have found to be not entirely satisfactory. I admit that fixation to joints is damaging to the joints. However, I am not sure that the elimination of all external splinting will be the final outcome of Dr. Hendon's research work. There are many methods of approach and of treatment of fractures, and the fact that there are so many is proof that not any of them are satisfactory in all cases.

I was a pupil of Dr. Hendon's some twenty odd years ago and have had an intimate acquaintance with him since that time, and I know that what he says should not be taken lightly.

The speaker has said that one can approach bone with a less degree of liability to infection or with the same degree as in approaching the peritoneal cavity. That has not been my teaching nor my experience. I feel that in his cases where he has approached the medullary cavity and has used the key on the endosteum repeatedly, that the absence of infection is due to a superlative technique on his part rather than to the lack of vulnerability of those tissues.

I have seen so many cases of open reduction of fractures that have been ruined by infection. Whether it is due to lack of technique or to the liability of infection of those parts I am unable to say. I think the time of operation is of great importance. I believe after a week or ten days time following an injury, the tissues take on a local resistance that helps us in our procedure as a protection.

I am unwilling to concede that all cases should have open reduction. I believe that many cases can be better treated by fixation, and we get quicker union without an open operation if the reduction is proper.

I cannot discuss the point that he makes that the reason some of us get in trouble is because we have used fixation. His experiments and his work show that he soon gets them out of bed. I believe it is a mistake to leave the impression that the bone can be opened easily without any trouble in any hospital, because all of us cannot use the same technique and have not had the experience that Dr. Hendon has had. I believe in the teaching that fractures cannot be indiscriminately opened.

I hope Dr. Hendon will continue along the line that he is now endeavoring; I think he will get somewhere with it. I think others can fol-

low up the work and get somewhere. It would be ideal to treat fractures without fixing the neighboring joints.

C. C. Howard, Glasgow: I have always been interested in anything Dr. Hendon brings up, because it is original; he does his own thinking. The subject of fractures has taken on so many changes, especially since the war. We used to think that we could not move the joints for quite a time, but we have dispelled that idea.

I have tried this method in only a few cases of fracture of the humerus, in those cases where I was unable to reduce. I used the method the doctor suggested, putting the peg in the medullary canal. While each one of these cases got good results, they were laid on a pillow for a few days, and then were out of bed in a sling. I have used it only in those cases that I was unable to reduce or where there was non-union.

This is a little bit off the subject, but I think those cases that we should use it in should be only those that had non-union or those we were unable to properly reduce.

I am like Dr. Garr, in thinking that the less operating we do on any case of fracture, if taken as a whole, will give us better results. I think you are going to have some trouble, sooner or later, if you are operating on a great many fractures.

In regard to the treatment of fractures without splints, a great many of these cases will get well with good results if we will just reduce them and put them in a sling, if it is the forearm, or in a fracture box if it is the lower limb, most men are getting away from using plaster of Paris or anything that fixes the joints. I know the best results I have had have been with some of those patients who defied my advice and went ahead and used the arm and got good function. I think this has been true of all of us in days that are gone—we put on Colles' fracture with tight bands and in many cases got a Volkman's constricture. We should learn not to put on a tight bandage or anything to constrict the circulation.

I looked into a lot of appliances during the war, and I can't say that I ever became well enough acquainted with them that I wanted to be using all of them. Those fractures get along better if you just reduce them and let them alone.

I believe this is a new method that has a value, especially in selected cases. I am very glad to have been here and to have heard Dr. Hendon's paper.

E. M. Howard, Harlan: Dr. Hendon says, "Lantern Slide Demonstration of a Treatment for Fractures," in the program. I believe we will all agree that so many of us have had imperfect results in fractures and there are many ways of treating them. There is no doctor here, I believe, who has not had to treat fractures or

who has not had fractures come under his observation. I believe there is no doctor here who has treated fractures who has not had some bad results.

When a patient comes to us with a fracture, he comes for the purpose of getting a result. It is necessary that he get not only a union of a bone that has been broken; it is necessary that he get a result that is functional, that is useful, so when that bone is set and gets union, he will have motion of the joint above and below that fracture. In many instances we do not get that, especially in a good many of our operations.

I appreciate very much Dr. Hendon's paper, because I have had an opportunity to observe some of his cases. We have done several bone peg, or as he said, bone key operations. Most of them have been very, very satisfactory. I can recall one humerus that we absolutely could not hold in place.

By the way, I intended to say in the outset that I had assumed that the bone key was used in cases that we could not treat and in which we could not get results by external methods. It seems that that assumption was a little wrong. If I understood correctly, (and I should like for Dr. Hendon to make that plain) he evidently operates on all of his bone cases. I would not endorse that. I think there are a number of cases in which we may first set our fracture properly and then maintain that position until nature effects a cure.

Those of you who were at the Ashland meeting a few years ago will remember that someone casually gave a definition of the practice of medicine. They said the practice of medicine was the science by which the doctor entertained the patient while nature effected a cure. That may have been said in a joking way, but certainly the science of treating fracture, or the practice of treating fractures, is the science or the skill, or both, where the doctor, after having properly gotten the alignment of his broken bones, and for a certain length of time maintaining that apposition of fragments, entertains the patient while nature does the repair work.

If we have an oblique fracture or a gunshot fracture with many broken fragments and are unable to maintain satisfactory apposition, there are other methods besides Dr. Hendon's bone key method by which we treat these cases. Personally we have used a great many Lane splints and Sherman splints.

We were first attracted to Dr. Hendon's bone key after we had had a number, at least three or four, of these steel splints break while in position. They were supposedly made of vanadium steel that will bend and not break. After promising our patients, in a way, that by an open operation we could get a very glowing satisfactory result, and then putting this steel plate on the bone, and having the bone as straight as a yardstick, or as it should be at least, then the plate

broke. It is very necessary, I think, that we follow up all of our fracture cases by frequent x-rays, at least frequent enough to know that your fracture is all right or is not all right.

Our plates began to break for some unknown reason, and consequently we were attracted to the bone key. We have had good results in all of our cases of bone key operations. We have had excellent results in some of them. In one case we treated a humerus and the man left the hospital between the second and third week. His folks were sick at home and he insisted that he must go. I saw no reason why he shouldn't go and I let him go. It was a perfect apposition. He did not have any splint on his arm; he had a bone key without any infection, and it was very remarkable.

In two of our cases of bone key applications, the bone keys broke. One was the case of a femur on which we had put a bone plate, and the bone plate broke. We felt chagrined to say the least. We knew we could not leave the leg in that position, so we went in and took out the bone plate and inserted a bone key. To our further chagrin, in a few weeks the bone key broke. The man is now under the observation of Dr. W. B. Owen, Louisville, who says that he has a good leg. The bone key broke, but the fragments held together enough that Dr. Owen says he will get good results.

In the other case, the man said a mouse got into bed with him, or he dreamed it did, and he jumped out of bed, and that one broke. He had no cast on.

I am sure you will not appreciate any one taking up your time as late as it is, but I should like to endorse Dr. Hendon's method as a method of treating fractured bones, not necessarily the method or the best method, but a method, and a good method.

Barnett Owen, Louisville: I have been practicing medicine for some twenty-five years and I have never been able to get the results that Dr. Hendon reported. I feel very much like the negro who said, "You ain't been nowhere and you ain't seen nothin'." We are all out of step but Dr. Hendon.

If the principles which he has outlined are correct, all of the former teachings are wrong. I have not had the experience with the method which Dr. Hendon has so well demonstrated tonight. Certainly the results in the fracture of the neck of the femur that he reports are far superior to my own or that of any other surgeon.

I feel that in fracture of the neck of the femur at least fifteen per cent of my cases got non-union; at least twenty per cent over sixty years of age died. Probably it is my fault; I may be treating them wrong. I think that is just about the experience of most men employing the principles advocated by Dr. Royal Whitman about twenty-five years ago.

The fracture of the neck of the femur is a sufficient problem from an intratrochanteric fracture. Practically all of those unite whether you treat them, or do not treat them. However, if the proper mechanical and physiological principles are not employed a disabling deformity will probably result, although union will take place. I see no particular reason, and certainly I would not want any operation performed on a bone of mine if I had reasonable assurance that a good result could be obtained without any operation, but I am not satisfied with the results obtained in fracture of the neck of the femur and I should like very much to adopt any method that would offer a higher percentage of bony union in the shortest space of time with the least danger to the patient.

I can not agree with Dr. Hendon that all fractures except a pathological fracture should have an operation and insertion of a beef bone peg. I believe we can get good function results in over ninety-five per cent of the cases without operation. Why would you want to operate? There are certainly dangers in all operations. I think there is far more danger in opening a bone than in opening the pelvic cavity. The lower abdomen has quite a resistance to infection. I used to do quite a lot of abdominal work, particularly in the city hospital, and I am sure in those days my technique was not as good as it ought to be now, and they had plenty of opportunity for infections and the results were as good as the average.

I think we are inclined, really, to keep our cases immobilized too long. In Colles' fracture for instance, reduction is the principal point; you would not need any splint except for protection. Many cases of fracture of the humerus can be put up in an airplane plaster of Paris spica, if you choose, and get the patient up the next day. The percentage of good function results when external fixation is applied is very satisfactory.

When we have reasonable assurance of establishing satisfactory reduction and maintenance of reduction by the employment of the proper mechanical and physiological principles, this should be done and open operation should be resorted to only after the surgeon has been convinced that results can not be accomplished otherwise.

It has been truthfully stated many times in the past that "it is not always the method employed, but the man behind the method."

G. A. Hendon, (in closing): I am very grateful for this generous discussion.

I want to say in justification for the change of the title, that some of the men who wanted to discuss the paper required a more specific title than the one originally adopted. I changed the wording so they would have advance information as to the kind of paper I was going to read.

I say to operate on all fractures of long bones,

I don't care what kind of fracture it is, so long as it is not a pathological fracture, or a simple uncomplicated fracture of the forearm. When I go into a hospital and see patients with these airplane splints, it makes me think of the time when I as a boy and went through a forest where the stark limbs of dead trees would project from their trunks presenting the most dreary, dismal scene that could be imagined. I was always expecting one of those limbs to fall on me. How much nicer and how much easier and with how much less trouble it would be to slip a key into the medullary canal, of humerus, put the patient's arm in a sling, and let him go his own way.

I want it to be understood that you can without special risk, without as much risk as you involve when you open the peritoneal cavity, open a fracture. I want to state that clearly because my experience has proven it. There is no more risk in opening a fracture if it is left unincumbered by apparatus than if the abdomen is opened under similar circumstances.

Suppose you were to open the abdominal cavity and then put a plaster of Paris cast corset on the patient, you would have peritonitis in half of your cases. The reason we are so afraid of open work in fractures is that the splints and external methods of immobilization embarrass the circulation and other local processes of vitality to that extent that the tissue cannot resist invasion of bacteria.

I don't want to modify a single statement I have made in my paper.

In a patient with fracture of the tibia, (by the way, always put the key in the medullary canal when you are dealing with the tibia, because there is not enough soft tissue to cover the ends if you put it crosswise) as soon as you are out of danger of infection of the soft parts, the patient can do anything with that leg that he did before except bear weight on it. He can get about on crutches, he can move the leg around, he can move it up and down, he can flex it and extend it, and do anything except bear weight.

Dr. Howard spoke of the bone key breaking. There are two reasons for breaking. One reason they break is that they are not large enough. For the humerus we use a five-eighths key, for the femur we use a five-eighths key. We use the square key. For other bones we use three-eighths and two eighths.

The other reason for breaking is that there is a great deal of effort usually made to get the key equally divided between both fragments. When only a snub is needed in one fragment.

For fractures of the forearm, I would not advise this method because splints on the forearm are neither cumbersome nor confining. But for fracture of shaft of the humerus I consider my method essential.

AN ANALYSIS OF FRACTURES AT THE LYNCH, KENTUCKY, MINES DURING THE PAST FIVE YEARS.*

By M. H. TODD, M. D., F. A. C. S., Lynch.

This report summarizes 551 fractures treated at the Lynch Hospital during the past five years, excluding fractures of the fingers and toes. Of these cases, 332 were injured in the mines and 219 in ordinary civilian life—74 of these being in children.

There is a striking difference in the distribution of the fractures in these groups. Of the cases injured in the mines, 60 per cent involved the lower extremity—nearly all of them below the knee. Only 18 per cent involved the upper extremity; and 14 per cent were injuries to the spine. There were only 3 Colles' fractures, and two fractures of the humerus in this group. On the other hand, of 80 fractures of the foot, all but one occurred in the mines.

Of cases not injured in the mines, 65 per cent involved the upper extremity, only 25 per cent the lower—almost directly the reverse of the percentage in mine fractures. Spine injury occurred in only two cases.

In children 30 per cent of the fractures were of the forearm and 15 per cent of the thigh—a surprising frequency. Fractures of the spine, the hand, the hip, the knee, the ankle and foot did not occur.

An analysis of the fractures of the various regions of the body shows the following facts:

There were 14 fractures of the skull—4 of these died, 3 after operation. Of the 10 living cases 2 showed marked depression of the bone; one, without symptoms, declined operation; the other showed headache and marked weakness, relieved by craniotomy. Our treatment of these skull fractures was guided partly by the clinical appearance and partly by direct measurement of the intraspinal pressure.

There were 47 cases of fracture of the spine, all but two of these being injured in the mines. These 2 were by gunshot wound—both fatal. Nine showed severe paralysis and 3 of these are living at present, two after operation. Laminectomy was performed seven times; five patients died in periods varying from 12 hours to 14 months after the operation.

We are not convinced, in the two patients now living after laminectomy, that the operation has been of any significant benefit; but we always advise its performance, where severe paralysis exists, for two reasons: In the first place the prognosis for such patients is

extremely bad, generally fatal, with or without operation; and operation offers a theoretical chance of relieving pressure on the cord, there being no other way of accomplishing this. In the second place, we have had a single excellent result following laminectomy six years ago, the case not being included with the present group. This patient had increasing paraplegia which was total by the end of the fourth day; he showed an immediate return of function after laminectomy and has now been returned to his regular work of loading coal for the past four years. It is true that in this case paralysis was not immediate nor were the sphincters involved, but the effect of the operation appeared very striking.

The group of spine fractures without paralysis is divided equally between cases showing compression fracture and these showing fractures of the transverse processes. The compression fractures, 19 in number, showed involvement usually of the 12th Dorsal or the 1st or 2nd Lumbar vertebræ. These patients were all injured in about the same way, being violently bent double so that the shoulders rested between the knees, the injury being therefore indirect: direct contusion, by contrast, gave rise to fractures of the transverse processes.

These compression fractures without paraplegia were nevertheless apt to have trouble with distension for a few days, and some of the cases required catheterization two or three times. Treatment was by rest in bed, generally on a Bradford frame, with padding to produce hyperextension. After a varying period a light plaster jacket was applied, the patient being swung face downward in a hammock attached to the Hawley table so that the hyperextension was maintained. It was difficult to persuade many of these patients that their injuries required recumbency and some of them got up and walked about despite rigid instructions to lie still. They were all made to wear a brace for several months.

The end results were in a general way quite good, though some of the patients gained so much weight that the spine had to bear an undue burden. In a few cases bony fusion occurred; in a single case this result was attained by operation. The majority showed no fusion but nevertheless showed good restoration of function and were able to return to moderate work.

The fractures of the transverse processes occurred from direct trauma—generally by falls of slate. They were treated by recumbency and some form of immobilization—many times a light cast or a brace. Generally speaking these injuries have left little or no permanent disability, though sometimes

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the muscles and ligaments appeared to be injured enough to give rise to real trouble. It is not difficult for the patient to malingering after such injuries and if he becomes aware that union of the fractures has not occurred it is easy to persuade himself and others that he is really very much disabled.

Curiously enough, actual sacro-iliac strain has not come under our observation. I have no explanation for this; for it would be supposed that at least some of the work in the mines would be heavy enough to cause this condition.

Eleven fractures of the pelvis occurred—8 of them injured in the mines, the other 3 being in children. Two of the nine cases were complicated by dislocation of the hip, in one case the head of the femur being driven through the acetabulum. In one child the fracture was complicated by an upward dislocation at the right sacro-iliac joint so that the whole right lower extremity was carried upward. Reduction in these cases presented no especial difficulty.

The pelvic fractures involved one or more of the pubic rami—generally without much displacement. There were no cases involving the bladder or the urethra in this present series. Treatment has been by immobilization on a Bradford frame, followed by a light plaster cast, and the end results have been in nearly **cases very good, the patients being returned to their regular work.**

We have treated 40 cases of injury about the shoulder; 31 of these were fractures of the clavicle. In only one case was there any noteworthy complication and this was in a severely comminuted fracture where a secondary trauma caused marked displacement before bony union had occurred, resulting in disturbance of the circulation of the arm. Operation was performed and some of the fragments removed, with immediate disappearance of the untoward symptoms. These clavicle fractures have been treated in the usual way, being reduced as well as possible and fixed with the Velpeau bandage, the Hawley T-splint or other special splints, or by modifications of the figure-of-eight bandage. We have found that any of these methods may fail to reduce badly overlapped fractures; but that the end results are none the less always very satisfactory as far as function is concerned. In the case of a woman if irreducible overlapping were present, it should be proper to secure reduction by leverage with a small chisel through a minute skin incision. In men, this is of course unnecessary. Dislocation of the shoulder has been very unusual; we have come across two recurrent cases.

Only 13 fractures of the humerus have come under our observation, and only two of these were injured in the mines. Four occurred in children. Treatment has generally been easy though in one case it was necessary to apply a plate. There was in one case a slight complicating radial paralysis, not persistent.

There were 29 fractures in the region of the elbow, only one being a mine injury, and this a trivial incomplete fracture. The head or neck of the radius was involved five times, once with dislocation which was reduced by open operation. There was only one backward dislocation of the forearm. Six fractures at the elbow occurred in children, in whom fractures at the lower end of the humerus are sometimes surprisingly difficult to reduce. One was a very severe compound fracture with some loss of substance in which it was necessary to use a plate to maintain any sort of position and alignment. The end result of all these cases has been good.

There have been 36 injuries at the wrist, 22 being Colles' fractures—only 3 of these occurring in the mines. There were 6 fractures of the scaphoid and three of these were operated upon, with one excellent result. Of those not operated upon, two showed a good result and one is still under observation. There was one fracture of the unciform and this healed completely by bony union with no disability. There were two dislocations of the scapholunar, one complicating a fractured scaphoid, some disability remaining. The uncomplicated one was easily reduced and resulted in perfect recovery. In children there were three Colles' fractures and two separations of the lower radial epiphysis; all healed without permanent impairment.

There were 32 cases of metacarpal fracture, 24 occurring in the mines—none in children. In two cases delayed union occurred, one being remedied by open operation and curettage; the other case being under observation at present. Reduction has generally not been difficult and in fact serious displacement is uncommon. Treatment has usually been by a light plaster cock-up splint.

To turn to the lower extremity, we have treated eight fractures in the region of the hip, two being injured in the mines. Both of these cases showed marked displacement, both were treated by operation and plating, and both gave perfect results. Two intracapsular fractures occurred in women, both impacted. One gave a perfect result, and the other in a very old woman appears to have given a good result, though the patient has since broken her other leg and is now bedridden. One comminuted fracture in a man of 40 years of age involving the region of both

trochanters resulted in complete non-union although apparently perfect position was maintained by traction with tongs. He did not consent to operation; present condition not known. Dislocation of the hip has been unusual, occurring only five or six times. Reduction has been accomplished by first attaining complete relaxation with ether and then using traction and manipulation after the method of Allis.

There have been 27 fractures of the femur, 12 occurring in the mines and 12 in children. Only three adult civilian cases came under observation. In the majority of these femur fractures, reduction has been possible by traction in the Thomas splint with suitable arrangement of slings. Where this has not been possible we have used the Sherman plate—nine times in all. The end results have been good except in one case of infection where motion at the knee joint is very much restricted.

There were thirteen fractures in the region of the knee, all except one being mine injuries. All healed kindly under simple immobilization, except in one case where a wide separation of the tip of the fibula had occurred so that the biceps was thrown out of function. In this case the small fragment of bone was fixed in place by a carpet-tack. We have not observed a transverse fracture of the patella, though there have been three cases of slight comminution of this bone.

There have been 81 fractures of the leg, 55 occurring in the mines, 7 in children. Treatment has generally been very simple, reduction being easy and position being maintained usually by a light plaster cast as soon as the primary swelling subsided. In seven cases the Sherman plate was used. Delayed union occurred in one fracture and non-union in one, union being secured at once by inlay graft. One patient developed gangrene of the leg and pneumonia and died. In a general way there have been but few cases of significant disability resulting from fractures of the leg, though occasionally a small amount of compensation has been granted to assure the patient the benefit of the doubt.

There have been 60 cases of fracture at the ankle, all but 10 of these being mine injuries—none were in children. Fifteen were cases of Potts' fracture; 24 fractures involved one or the other malleolus. There have been three cases of dislocation of the astragalus, two of them compound. In one case astragalectomy was done; in the other the bone after being thoroughly cleansed where it protruded was replaced and has healed without complication. This patient is still under observation, having sustained in addition a fracture of

both femurs. Two cases of fracture of the astragalus, one complicated by dislocation, have given perfect results.

The treatment of these fractures at the ankle has generally been by simple recumbency until swelling has subsided and then immobilization in light plaster Paris. Non-union of the internal malleolus occurred twice: there was disability in one case and union was secured by a small inlay graft; the other case did not complain and no treatment was undertaken—he is working regularly.

Eighty fractures of the foot occurred, the metatarsals being involved for the most part. All were injured in the mines except a single railroad case. In a general way no disability has resulted from fractures of the metatarsals; marked displacement is unusual and bony union, even with some displacement, invariably occurs. We have not seen traumatic flat-foot although this would rather be expected; and it has seldom been necessary to fit the foot with an **arch-support**. Treatment has usually been a simple light plaster cast, avoiding weight-bearing until solid union has occurred.

There were eight cases of fracture of the os calcis; in one, the railroad employee, bilateral. Treatment has been by simple immobilization as a rule, displacement occurring in only one case. The end results have been very good, there being no remaining disability except in the single case where the bone was decidedly deformed and where a complete reduction was not obtained. These patients have all returned to work and complain of no trouble, except in the case mentioned. Disability in this case, however, is by no means severe—regular moderate work being continued as before injury. There have been two cases of dislocation of the bones of the foot; in one the four outer metatarsals were displaced outward en bloc, in the other the first metatarsal and internal cuneiform were displaced inward. There is some remaining disability in the former patient, though he is working regularly in the mines.

During this five year period we have performed only eight major amputations—six in mine injuries. Seven amputations were of the leg in the middle third and one of the thigh in the lower third, in a child run over by a train.

We have nothing new to offer in the treatment of fractures, our methods corresponding to those generally accepted. We believe that as nearly as possible an anatomical reduction of fractures should be accomplished, though it is quite true that satisfactory function may follow quite imperfect position and alignment. Correct position is especially necessary in the lower third of the forearm.

We have generally allowed more time for complete union than the period usually described in the textbooks, before permitting any particular strain on the injured bone: this length of time varies with each case, progress being checked by taking monthly x-rays. In this connection, we make free use of the x-ray in all cases where fracture exists or is suspected: for only in this way can a certain diagnosis be made. It is essential that the films be as clear as possible: for otherwise a slight or incomplete fracture may be overlooked. This is especially true in taking lateral views of the spine. It is also important to check and re-check the position of the fracture and the progress of its union. In the case of fractures of the femur the bedside unit is very valuable.

We are very much impressed by the important role played by soft parts in fracture cases, their good or poor condition often dictating the method of treatment to be used. There is one especial point in this connection that deserves mention, namely, the fact that extravasation may result in so much tension that circulation below the fracture is cut off, with resulting danger of gangrene. We have had a case, for instance, of fracture of the base of a metatarsal where the dorsal artery of the foot was ruptured by the same trauma and where from extravasation the whole foot became cold, hard, and waxy. It was completely insensitive, though the patient complained of violent pain, uncontrolled by morphine.

These symptoms were immediately relieved by a simple incision through the deep fascia; it is certain that gangrene would have otherwise occurred. We believe that the same condition may occur in some fractures about the elbow and may explain cases of Volkmann's contracture where no tight splintage has been used. This contracture, by the way, we have not observed.

The technique of open reduction deserves a word though its principles have been clearly laid down by Lane, and by Sherman, the extraordinary perfection of whose results in large series of cases is a challenge to all who handle fracture work. A rigid Lane technique is essential with careful blocking-off of the wound so that nothing can by any chance touch the patient's skin after the incision is made. The surgeons' gloves should remain unstained by blood, never entering the wound. It is important to control all bleeding and especially important to avoid any dead space about the bone. We have used only the Sherman vanadium-steel plate and when this is properly made it is a perfect instrument for this purpose. We have three times, however, been unfortunate in getting defective plates,

evidently made of inferior material during the war; these plates broke. In a single case of fractured femur our x-ray failed to show an incomplete line of fracture above the main break in the bone and after we had carefully plated the main break and returned the patient to bed, a little movement on his part completed the other fracture though the plate itself held perfectly. Such a case emphasizes the importance of perfect x-rays.

We have only used the plate in selected cases; but union is much more rapid and perfect with its use. If it is necessary to use it in compound fractures the wound should not be closed but should be treated after the Carrel-Dakin technique. If the plate and the bone in such cases can be loosely covered with soft parts it is entirely possible for the plate to heal in place despite the wide-open wound; this has occurred three times in our experience.

Quite a number of our fractures have been compound but infection is very unusual. Tetanus we have never seen. Even where the bones protrude into the clothing or into the dirt, it has been possible after cleansing and careful trimming to put them back in place with healing per primum. Where the soft parts are badly injured, we provide for the Carrel-Dakin treatment. This kind of healing of badly lacerated wounds is in part due to their immediate attention and hospitalization, and in part to the apparent infrequency of virulent bacteria in the mines. The case is quite different, for instance, with railroad surgery where virulent infection appears to be common.

We have found that actual non-union is very uncommon, though delayed union occasionally occurs.

A word about immobilization in plaster is perhaps worthwhile. We are very careful to make our casts exactly fit the injured part; we use only the best dental plaster, and generally use only two or three bandages. The cast is therefore thin and light but very strong when hardening has occurred; and we mould it so that instead of being merely a cylinder of plaster, all of the contours of the injured part are followed and reproduced in the cast itself. It is sometimes necessary because of swelling to wait a few days before a cast is put on; but many times it is applied as soon as the patient reaches the hospital. The extremity is elevated at once; and secondary swelling requiring splitting of the cast is quite uncommon; circulation is of course watched most carefully.

The most important feature in the after-treatment of fractures appears to be the voluntary use of the injured member by the pa-

tient; progress is very much more rapid by this means than by the use of massage, diathermy, etc. We have therefore made it a practice to return all injured men to some form of very light work as soon as their condition warrants it. In this connection there is a very remarkable difference in the speed of recovery of these injuries, depending upon whether or not the patient was injured as a compensation case. As long as he is paid during his period of idleness his rate of progress is moderate to say the least; this applies as well to the question of accident insurance. If, however, the patient was not injured in line of duty and has no insurance it is truly astonishing how rapidly he regains his ability to do full duty, and how little permanent disability remains. I have in mind a poor result in a Colles' fracture with extraordinary comminution, the worst I have ever seen, and in which I obtained only a very mediocre reduction; this patient returned to work in three or four weeks less time than the average, and while x-ray shows considerable deformity he has never lost a day's work. Had this been a compensation case we should have had to pay this man, I am sure, not less than 30 per cent disability to the hand.

Our various fracture cases have been followed for many months—in fact we are compelled to do so by the compensation laws; we have, therefore, had the opportunity forced upon us of observing all of our end-results. In a general way they are very good and I am sure that this is the experience of all those who treat and observe fracture cases. Really serious disability is very rare, the patient practically always returning to his previous occupation and working steadily at the same wage. This statement, however, is not so true of compression fractures of the spine, where a little disability usually persists.

The conditions for treating these cases at Lynch are quite favorable, the hospital being close to the mines; and several members of the personnel are trained in the use of the x-ray so that this service is obtainable at any hour of the day or night. Complete diagnosis can therefore be made at once, and immediate attention, the importance of which was demonstrated in the war, can be given in all cases.

COMPARISON OF ESTIMATED AND ACTUAL DISABILITY IN CERTAIN GROUPS OF FRACTURES, "FOLLOW-UP" OF CASES, DEDUCTIONS.*

By ELLIS DUNCAN, M. D., Louisville.

Believing that the best and most practical guide for attainment of the highest degree of truth, accuracy and fairness to all parties concerned, in the estimation of disability incident to industrial injuries, may be found in a review of observations in practical experience based upon a comparison of estimated disability, with what has proved to be the actual disability, I am submitting some of my own data. The latter is entirely with the idea of to some degree stimulating thought and discussion on the subject.

The Compensation Board, like Pilate, is constantly wanting to know "What is truth?" The very embodiment of Truth stood before Pilate when he propounded his famous question. He had objective evidence, but was incapable of recognizing it. The Compensation Board, unlike Pilate, has a higher and nobler motive, but usually has no objective evidence except what a trained, experienced surgeon can put before it. Hence its modicum of truth must depend largely upon what the surgeon can supply for it. It is with the idea of stimulating the hunt for real signposts to truth, rather than to show how many fractures I have treated since the war—and what remarkable results have been attained, that I am submitting reports on a few either interesting or typical cases—most of which are illustrative of groups. My reports and remarks are based entirely on personal experience and observation. There will be no bibliography.

(1) H. B., male, 35 years old. Laborer on construction job. Left leg caught between bucket and frame in concrete hoister April 22, 1926. Complete comminuted fracture middle and lower thirds shaft left femur, comminution involving $7\frac{1}{2}$ inches shaft of bone to point 1 inch above condyles.

Treatment: Mereurochrome dressing to flesh wounds—leg put in modified Thomas splint (with adjustable screw extension appliance)—leg slightly elevated. Very unsatisfactory as permanent dressing. Fifteen days later under general anesthetic put steel pins in upper parts condyles, employing caliper skeletal traction, using weights varying from 15 to 28 pounds, the leg resting in posterior wire cradle splint—knee flexed 40 degrees—kept on four weeks. For eight days follow-

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ing removal of pins leg was kept in the posterior wire splint to allow better observation and daily dressing of infected wounds where pins had been used; then applied plaster of Paris cast from costal margin to toes—knee maintained in 40 degree flexion—no extension used. Able to come to office for physical therapy July 4th, 74 days after injury, the latter consisting of moist or dry heat, massage and passive motion. Returned to work November 27, 1926. Work of same character at same wages, and is still working, having lost no time. Limps. When final report was made on case, permanent partial disability estimated at 15% of total for the leg, there being 1 1-8 inch shortening and 60% flexion at knee. Recent examination shows 1 1-4 inch shortening and 64% flexion at knee. Extension normal; muscle development normal, no complaint. Estimate of permanent partial disability unchanged, although, economically he has had none at all so far.

Preliminary estimate temporary total disability, 35 weeks.

Actual temporary total disability, 31 weeks.

Estimated permanent partial disability, 15% of leg.

Present permanent partial disability, 15% of leg.

(2) T. A., male, about 35 years old. Injured February 28, 1927, operating motor tractor in lumber yard. Left leg pinned between tractor and steam pipe. Complete oblique comminuted fracture shaft left femur, 1½ inch above condyles. Same day leg placed in double inclined plane posterior splint and caliper skeletal traction applied to upper part of condyles (under general anesthesia) 15 to 28 pounds weight traction for four weeks. After removing calipers, allowed leg to rest in same splint nine days, then applied plaster of Paris cast from costal margin to toes and sent him home. Removed cast forty days later. Knee about 40 degrees flexed throughout, and passive motion begun at home and later continued at office, soon followed by active motion. Returned to same work August 22, 1927; still on the job, having lost no time, same wages. There was 3-4 inch shortening and inability to fully flex knee, range of motion being about 60% of normal.

Recent examination: Full normal range of motion in knee joint, normal muscular development, 3-4 inch shortening.

Preliminary estimate temporary total disability, 16 to 20 weeks.

Actual temporary total disability, 25 weeks.

Estimated permanent partial disability, 15% of leg.

Present permanent partial disability, 5% of leg.

(3) T. L., male, 70 years old. Senile defect in vision on account of which he lost his job as chauffeur less than one year prior to accident. Injured April 20, 1927. Was on scaffolding washing ceiling, board slipped and he fell on iron radiator. (a) Complete oblique intertrochanteric fracture right femur. (b) Complete comminuted oblique fracture lower part shaft, same bone, extending into knee joint. (c) Badly comminuted fracture lower extremity left tibia. Fracture lower extremity left fibula (external malleolus). There was considerable traumatic shock and later much pain. He would not go to a hospital, but he had a good home. I bought a fracture bed and put him in it on a Bradford frame; left leg in a plaster of Paris cast from perineum to toes, knee extended. Right leg placed in posterior straight wire cradle splint from perineum to heel (foot not included) and Buck's extension applied; foot of bed elevated. No abduction. Balkan frame applied to bed so he could raise himself and so could sling up right leg if desired (this was done and kept so). General condition remained good—no bed sores—good appetite, cheerful and optimistic throughout. Developed very troublesome ulcer back of right heel which gave him more real trouble than anything else, and which was last lesion to heal. May 18 (4 weeks) extension removed from right leg but kept slung up in posterior splint. June 17, about 8 weeks, plaster of Paris cast removed from left leg. Same date off Bradford frame and sitting up much of time. Shortly thereafter (record does not show exactly) everything removed from right leg and massage and passive motion begun on both legs. July 1st up in chair. August 31st came to office for x-ray and physical therapy. The latter continued at office twice a week until October 25th when he was discharged. He could then walk rapidly with cane; limp in right leg; gait suggestive of that of flat-footed man.

Shortening in right leg, 1 1-4 inch.

Shortening in left leg, 1-4 inch.

Difference, 1 inch.

Motion right hip, 90% of normal.

Motion right knee, extension normal, flexion, 80%.

Motion right ankle, very slight foot drop (equinus position), dorsal flexion 75%.

Recent Examination:

Right hip joint, 95% (10% limitation abduction and 3% limitation flexion).

Right knee joint, extension normal, flexion 90%.

Gait and posture normal.

Slight foot drop, right foot, but can actively dorsi-flex as well as other ankle.

Active plantar flexion, equal in both ankles, but passive plantar flexion 10% more in right. Passive dorsi-flexion 10% more in left ankle.

Present measurements show right leg to be 5-8 inch shorter than left.

When case was closed, 11 months ago, there was 1 inch difference. Can only account for this by gradual shortening at site comminuted fracture left tibia and fibula.

Preliminary estimate temporary total disability, 35 to 40 weeks.

Actual temporary total disability, 37 weeks.

Preliminary estimate (when discharged): right leg, 25%; left leg, 5%.

To man as a whole, 20%.

Present estimate: Right leg, 20%; left leg, 5%.

To man as a whole, 15 to 20%.

(4) G. McD., school boy, 13 years old. Injured February 9, 1924. Fell on concrete while roller skating. Fracture shaft both bones, left radius and ulna. Unable to get satisfactory reduction and maintained it by closed method. Two weeks later radius wired; all dressings removed six weeks thereafter and physical therapy begun.

Temporary total disability, nine months (returned to school). No permanent impairment.

Recent examinations (4½ years after injury) shows no impairment; normal growth and development. For past year has been working steadily in composing room of newspaper. Prior to that went to school.

(5) H. S. C., male, 40 years old. Injured August 10, 1927. Fell off ladder catching left arm between two rungs of ladder. Comminuted fracture, distal part shaft, left radius. First aid and dressings applied in Evansville, Indiana. Came to me one week later. X-ray showed inward displacement of distal fragment. He was put under general anesthetic and under fluoroscope, fracture was reduced. It looked like good position so dressing was applied—double splints applied to forearm, wrist and hand. X-ray the following day—position unsatisfactory, so sent to hospital on August 20—fragment wired. Even then did not get perfect position. All dressings removed and physical-therapy begun four weeks later. November 23, 1927, returned to work—same work, same wages, no time lost since.

Present condition: Shows no impairment whatever. Perfectly satisfied at present; has two years for closing case in which he may make claim for permanent partial disability; has made none and states he is sure will not make any. Occupation, asbestos worker, covering steam pipes, etc.

Preliminary estimate temporary total disability, 10 weeks.

Actual temporary total disability, 15 weeks.

Estimate permanent partial impairment close case, 10% for arm.

Present permanent partial disability, none.

(6) J. S., male, 33 years old. Electrician. Injured January 19, 1927. Fell 12 feet from ladder striking on wood floor. Fractured shafts right radius and ulna at junction middle and lower third. Tried, but failed, to maintain fragments in satisfactory position by closed method. Nine days after injury wired radius—thereafter following usual treatment. Returned to light work in 16 weeks, at regular wages. Eight weeks later resumed regular work.

Permanent partial disability estimated at 15% for arm; settled on that basis—approved by Compensation Board.

Three times since returned to work has come to see me about slightly painful, fluctuating swelling over radius opposite silver wire suture. First time advised few days' rest; it disappeared. Second time advised same with hot, moist applications; it opened, drained, and after few days drainage closed. Third time, under local anesthetic, I attempted removal of silver wire suture, but only partially successful on account of knot being embedded in callus. Wire cut off flush with bone. No trouble since (nine months). These three "flare-ups" cost him ten days' time.

Present condition: Rotation, 75% to 80%, the loss being mostly at expense of supination. No other function defects. Muscular development better than other forearm (right handed). Wrist and hand function, normal.

Preliminary estimate temporary total disability, 12 weeks.

Actual temporary total disability, 16 weeks.

Estimate permanent partial disability at close of case, 15% for arm.

Present estimate, 10% for arm.

(7) C. B., male, 23 years old. Structural iron worker. Injured March, 1925. Steel girder fell on right forearm. Fracture shafts both bones forearm, with severe trauma to soft structures. Treated by closed method, although I was not satisfied with it, advising operation, which he refused. Returned to same work at same wages and has lost no time.

Present condition:

Rotation forearm, 80%.

Carpal extension, 80%, otherwise normal. Muscular development normal.

Preliminary estimate temporary total disability, 12 weeks.

Actual temporary total disability, 17 weeks.

Estimated permanent partial disability,

20% for arm.

Actual permanent partial disability, 5% (or less) for arm.

(8) D. R., male, 55 years old. Injured November 5, 1923. Structural steel fell on right forearm and wrist—crushing injury with much trauma to soft structures; immediate permanent dressing without anesthetic; double wooden splints to finger tips. A week later shortened to metacarpophalangeal joints. Splints removed in four weeks, and physical therapy begun. Returned to work 17 weeks later—same job, same wages. No time lost since.

Present condition:

Carpal extension, 95%.

Carpal flexion, 95%.

Ulnar flexion, normal.

Radial flexion, 40%.

Digital extension, normal.

Digital flexion, 95%.

Grip, normal (very powerful).

Permanent partial disability, 5% of arm.

Preliminary estimate, temporary total disability, 12 weeks.

Actual temporary total disability, 17 weeks.

Estimate permanent partial disability when case closed, 25% of arm.

Actual (present) permanent partial disability, 5% of arm.

(9) H., male, aged 30 years. Wrecker. Injured May 25, 1925. Arm kicked while cranking truck. Fracture lower end right radius, x-ray at once showed dislocated distal fragment with bad dorsal tilting and deformity. Immediately anesthetized for complete relaxation, reduction and application double splint under fluoroscope. Second x-ray film, same date, for record.

Preliminary estimate temporary total disability, 8 weeks.

Actual temporary total disability, 8 weeks.

Estimate permanent partial disability at close of case, none.

Actual permanent partial disability, none.

(10) W. C., male, 34 years old, weight 220 pounds. Taxi driver, injured December 28, 1927. While walking across street slipped and fell on right knee, striking heavily on steel rail of car track. Brought into my office at once. Comminuted fracture patella, knee joint extremely distended with blood, hospitalized, leg elevated, full extension at knee, cold applications. Two days later open operation, found bad comminution, but three main fragments which were wired together with two silver wire sutures, carefully avoiding posterior of bone. Mattress suture of heavy K T placed in fascia on each side patella. Interrupted sutures No 2 chromic cat gut for better apposition of fascia—closure without drainage. Plaster of Paris cast from perin-

eum to toes, full extension at knee, leg moderately elevated, window cut for drainings. Cast removed in about 6 weeks, February 14, 1928. Physical therapy begun February 22, 1928. Returned to work March 15th.

Examination at close of case showed:

Extension of knee, 100%.

Flexion of knee, 60%. No pain. Has worked steadily at same job. Lost no time. Makes same money.

Present condition:

Extension, normal.

Flexion, 70%. Appears to have been slight separation of fragments with fibrous union. Very slight lateral passive motion between fragments. Function normal, except limitation of full flexion (70%).

Preliminary estimate temporary total disability, 20 weeks.

Actual temporary total disability, 11 weeks.

Estimate permanent partial disability at close of case, 15% of leg.

Present estimate permanent partial disability, 20% of leg.

(11) K. C., male, 18 years of age. Injured March 21, 1928. Was riding motorcycle had head-on collision with automobile. complete comminuted fracture lower third shaft left tibia and fibula—severe hemorrhage. Immediate open operation. General condition not good on account of shock and hemorrhage. Blood clots, shredded muscle and fascia cleaned out; fitted fractured ends tibia together (disregarded fibula) put rubber tissue drain in original wound, sutured periosteum with No. 2 chromic cat gut, muscles and fascia with same, skin with silk worm gut. Plaster of Paris cast applied from perineum to toes; slight flexion at knee, window cut for dressings. Following day drain removed, prompt healing of incision and flesh wound without evidence of infection. Cast changed four weeks later. Cast removed May 16th. Evidence of extensive infection skin glands lower leg. Nine weeks after accident, May 28, 1928, had chill followed by temperature of 104°F., accompanied by severe pain and tenderness over tibia two inches above fracture line. Moved back to hospital and under general anesthetic incised muscles and fascia over tenderest point. Nothing found; then bored hole in subjacent tibia with doubtful findings; no "frank pus"; drainage, hot moist saline dressings. Temperature and pulse went higher on following day. Case looked desperate. Gave 20 cc. 1% mercurchrome intravenously, after which it looked more desperate for few hours, but soon showed improvement. Two days later free discharge of pus from point opposite fracture line tibia on inner anterior aspect, followed by subsidence of toxic symptoms. Had no tenderness here. Wounds healed, but occasional recur-

rence of sinus with slight discharge. Small sequestrum removed two weeks ago. Union delayed. Lower leg brace applied and advised to walk. Present clinical examination shows solid union; still using brace, walking with cane, no pain. Present treatment dry heat and sunlight. Advised to walk on leg.

Preliminary estimate temporary total disability, 16 weeks.

Actual, still disabled and will probably be for six months longer. Reason: Infection.

(12) D. C., male, 56 years old. Very active business man. June 1927 developed osteomyelitis shaft left femur, following severe contusion front lower part of thigh. Condition not suspected until swelling appeared, from subperiosteal abscess. Abscess evacuated and thorough drainage established, followed by no relief. September 14, 1927, trephine opening made in bone—free purulent discharge—two rubber drainage tubes inserted for irrigation. This followed by relief from pain and toxemia. Was apparently healing satisfactorily when slipped off chair to floor, causing fracture at site of trephine. Plaster of Paris cast applied at once with as little disturbance as possible. Prompt union. Began to walk with cane about May 15, 1928. Small sequestrum came away about two weeks ago.

Present condition:

Three-fourths inch shortening of leg; no local symptoms.

Extension knee normal; flexion 60%.

(13) E. A. B., male, about 42 years old. Clerk in foundry. Injured April 23, 1925. Started down with elevator, top of elevator hung on edge of floor, safety catch failed to work, elevator fell to bottom, injuring left foot, also caused left inguinal hernia. Fracture left os calcis. No evidence involvement of sub-astragaloid articulation. Plaster of Paris cast applied from lower leg to toes. Returned to work on crutches in three days. Began to walk without support in ten weeks. No trouble since. No deformity; perfect function. Same work, same wages. Has had no trouble since.

(14) J. C. R., male, 43 years old. Injured June 14, 1927; labor foreman. Scaffold broke, fell 12 feet, landing heavily on left foot on concrete hoist. Comminuted fracture left os calcis, involving subastragaloid joint. Bone molded as well as possible. Foot and ankle encased in plaster of Paris cast. Cast removed July 6, 1927 (three weeks) and physical therapy begun.

Preliminary estimate temporary total disability, 8 weeks.

Actual continuing temporary total disability, 29 weeks.

Worked two weeks and had to lay off four weeks longer. Thereafter occasionally for a

day or two at a time. Has worked steadily at same pay, suffering more or less constantly in left foot.

Present condition:

Walks with limp in left foot. Marked lateral thickening through foot below malleoli. Tenderness on firm punctate pressure just below malleolus. Abnormal prominence of os calcis on internal aspect just below malleolus.

Hinge motion ankle, normal.

Lateral tilting of foot much limited (50%).

Rather rough, forced manipulation of foot causes pain below external malleolus. Very slight pronation and very slight flattening left foot (more so than right). States that principal cause of trouble is pain in outer side foot below external malleolus. Made worse when he stands or walks on it—very severe at times.

Preliminary estimate temporary total disability, 8 weeks.

Actual temporary total disability, 33 weeks.

Estimate permanent partial disability when case closed, 10% for leg.

Present estimate, 15% for man.

(15) J. A., male 30 years old. Good general health. Injured April 16, 1928, automobile collision.

a. Fracture right clavicle, oblique, outer part, middle third. b. Fracture distal ends left 2, 3, 4 metatarsal bones, base of proximal phalanx, left great toe, communicating with metatarso-phalangeal joint. c. Fracture left cuboid bone.

Treated at office and his home. Reduction metatarsal fractures by extension, counter extension and manipulation. Plaster of Paris cast applied from four inches above ankle to tips of toes, pad being placed under metatarsal fractures. Posterior interseapula splint applied for holding and immobilizing right clavicle. May 9th, cast removed. Also clavicle dressing removed, except arm kept in sling. This man had so many accident insurance policies carrying weekly payments during total disability, that the latter was greatly prolonged. Also his employers paid him his full wages, so that his weekly income was more than twice as much as when he worked. This proved to be a very real and serious obstacle to getting him back to work (and in my experience this is always true).

First came to office for physical therapy June 10, 1928.

Case closed and reported ready for work July 30, 1928.

He appealed to Compensation Board and was referred to another surgeon for examination and estimate of permanent partial disability. This was done without my knowledge, but it so happened that we arrived at the same conclusions, the result being that the

man returned to work July 30th, with an estimate of 10%, permanent partial disability to the foot. This was approved by the Compensation Board. The man has lost no time, and is doing same work very efficiently, with same wages.

Recent examination: Right shoulder and clavicle, normal.

Left foot, slight fullness through metatarsal region, moderate stiffness metatarso-phalangeal joints, limiting motion of toes.

Preliminary estimate temporary total disability, 10 weeks.

Actual temporary total disability, 15 weeks.

Estimated permanent partial disability, 10% for foot.

Present permanent partial disability, 3% for foot.

DEDUCTIONS.

(1) From the above it seems evident that I have pretty regularly underestimated temporary total disability, and have overestimated in most cases, permanent partial disability.

(2) In so far as temporary total disability is concerned my worst cases have been fractures of the calcaneum, particularly if the subastragaloid articulation has been invaded. In these cases I have also frequently underestimated permanent partial disability. In this connection I wish to submit a quotation from a telegram just received from Dr. John D. Adams of Boston, who has given a great deal of time and study to the question of disability. In response to my telegraphic query as to the length of temporary total disability in certain fractures:

"Average total disability of fractures of femur six months, partial three months longer; tibia about three months and six months; Potts six months; os calcis longest disability of any fracture—usually one year; humerus 3 to 6 months, depending upon nearness to joints; disability from fracture both bones forearm depends entirely upon limitation of supination and pronation; simple Colles fractures 8 weeks disability. Compression fractures of the spine are placed immediately in plaster of Paris cast for 8 weeks, then followed with brace. Bone graft is only done where deformity shows increase at end of three months, patient usually returns to work at end of six months with light support."

(3) I have encountered many fractures, especially about the feet, which on clinical x-ray examination have seemed to be quite trivial, but which have been disabling out of all proportion to their magnitude. I have on hand at present a man with a slight distraction fracture of upper part of posterior extremity of first left metatarsal bone, together with a barely perceptible fracture of external sesamoid bone beneath first metacarpophalangeal joint. This man has been to-

tally disabled since July 30th, 1928. His difficulty is almost entirely with the sesamoid bone. I had a similar case (fracture of same sesamoid bone) about a year ago, in which there was prolonged disability.

(4) It is by no means true that the most immediately serious fractures will be followed by either the longest temporary total disability, or the greatest percentage of permanent impairment.

(5) Prompt decision as to the final plan of treatment, followed by prompt execution of that plan, will materially reduce both temporary total and permanent partial disability. I lost fifteen days in a femur fracture before employing the best treatment (which was skeletal traction). I formerly got longer temporary total disability and more or less permanent impairment in cases of fracture of lower end of radius, the permanent impairment usually being due to dorsally tilted articular surface with humping up of back of wrist, limiting wrist motion, digital flexion and power of "grip"—this constitutes a real impairment to a working man. My present plan is: First x-ray examination; 2nd, thorough relaxation under general anaesthetic with careful reduction under fluoroscope; 3rd, double wooden splints (properly padded) extending to finger tips; 4th, x-ray to check and for record. In five to seven days splints are shortened to metacarpophalangeal joints for finger motion. In two weeks dorsal splint removed. In four weeks other one removed and physical therapy begun. When I have followed this plan there has usually been a relatively short temporary total disability and no permanent partial disability, and with no objectionable deformity.

(6) Infection is our "bête noir" as it has always been.

(7) I shall employ skeletal traction in my next case of badly comminuted fracture of both bones of lower leg. I have been surprised at the amount of shortening which may occur in these cases.

(8) It seems to me that the estimation of permanent partial impairment should be varied to a certain extent in accordance with the injured man's occupation. A right handed painter or plasterer, who, after a fracture of head or neck of right humerus, or of greater tuberosity, and thereafter is permanently unable to carry his arm from horizontal to vertical position, is very seriously disabled—much more than if he were a common laborer; likewise the man, or woman, whose wage earning capacity depends upon delicate skill and speed with hands and fingers, who has a permanently disabling injury to a hand or even a thumb or finger, may be very seriously disabled. It is important to know and to consider whether you are to estimate the dis-

ability of a common laborer, or a specialist in labor, and, further to consider the physical requirements of that specialty.

(9) Physical therapy is of major importance in the treatment of fractures. The essential requirements are: moist or dry heat; massage, passive motion, active motion. It is only by employing these measures, after sufficiently firm union has taken place (and occasionally to stimulate union) that a minimum of disability can be attained *prior to going to work*. But right here I may state that I have learned something by my "follow-up" activities. What we take to be *permanent* partial disability (estimated prior to going to work) is almost invariably progressively and very materially diminished within a few months after the man has resumed his regular steady work; and this may mean that after all, getting a man back to work may do as much or more for him than physical therapy. The man (I do not refer to malingerers) who remains off work too long, is undoubtedly prone to the development of a habit of inertia—and habits are hard to overcome. Don't carry physical therapy too far.

(10) It is essential, early in treatment of fractures, to look for, and eradicate, any or all sources of focal infection. Also very often a blood or spinal fluid Wassermann should be made, as well as the other routine methods of laboratory help in diagnosis and treatment.

(11) It is of very material and practical importance to always make a consistent and sincere effort to establish friendly, or at least pleasant, relations with the industrially injured. It inspires confidence, helps to dissipate the workman's all too frequent prejudice against the "Compensation Doctor." This will help everybody concerned, and it is very certain that it shortens temporary total disability and often results in a fairer final settlement. It is up to the surgeon to be sympathetic and tolerant. He should have a broader viewpoint than the injured man, and it is more up to him to exercise self control.

(12) It is my very firm conviction that we should ever keep in mind that in industrial surgery, just as much as in any other branch of therapeutics, our first duty is to the patient. If we hue to the line in this respect, it is certain to prove more satisfactory to all parties and interests concerned.

(13) My attempts at following up these cases, which have been successful to a very limited degree, and which have caused me to realize the truth of the old adage that "a stern chase is a long one"—have convinced me that there would be real and practical value in a systematic follow-up of all classes of disabling injuries. We all want to be fair and honest—we want only the truth—this applies equally to the injured man, his em-

ployer, the insurance carrier, the surgeon, the surgical examiner for the Compensation Board, and the Board which has the final word in the matter. The final results help to promote efficiency in labor and happiness in the laborer's home (to say nothing of the peace of mind of the insurance adjuster).

Where would civilization be without efficiency in labor, and happiness in homes? I am not claiming that the specialist in traumatic surgery can "win the war," but he can do his bit.

DISCUSSION

E. M. Howard, Harlan: Compensation work is very interesting to doctors who are around the mines or in industrial work. Dr. Todd's paper is especially interesting to me because I have had an opportunity to observe his work quite extensively. When I was in Europe, they told me that Monaco was about the smallest principality in the world, but I think the Lynch mines where Dr. Todd is located is about the smallest principality. They have everything they could want in the way of government, and, incidentally, they have a very wonderful hospital, supported and kept up by the United States Steel Corporation. Dr. Todd has every kind of appliance, I think, for treating fractures, as well as for any other work, and his work is really wonderful.

We have taken fracture work very seriously. In Harlan we are located in the center of a coal field with almost 100 mines. We have fractures coming from all parts of the county to our hospital located in Harlan.

We have not always had good results. For different reasons, we have tried very hard to get results; our patient is entitled to good results, and we know that our coal companies, who pay the bills, are entitled to have a man returned to work with just as little disability as possible, another very good reason for undertaking to get good results.

We heard last night from Dr. Hendon, in presenting his very able paper, a discussion of a treatment of fractures. We will hear from time to time of other treatments of fractures.

Dr. Blackburn, our President, gave a very able address yesterday morning, and he mentioned things that were orthodox in medicine, things that were orthodox in surgery. Who can say to us what is orthodox in the treatment of fractures?

In England, comparatively recently, a blacksmith by the name of Reese had occasion to set some bones in his neighborhood. The bones were so well and so perfectly set and the results were so flattering that other people came to him for bonesetting. In the course of a few years he was known as Bonesetter Reese. I believe that man reached the point of being firmly established in London as a bonesetter, right in the midst of staid old London where everything is supposed to be just so. It took considerable ef-

fort to disengage him from that work.

Each fracture is an individual case in itself, and I think we can treat them only in that way. We cannot lay down any law that is orthodox; we cannot have any one appliance. I believe we should be equipped with all the appliances that we can get that are valuable and useful. I believe we should use every endeavor to set our fractures, first by the use of the x-ray, then follow them up and see how they are doing, watch them closely and regularly, and if they do not stay put, set them again. If there is no way by our external means, Thomas' splints and skeletal appliances, to keep them in place, then an open operation with bone pegs or bone plates should be done, but the main thing is to get them in place.

We have observed and treated 3,159 fractures in our little place. Excepting the fingers and toes, we still have 2,427 fractures treated. That is not so many as some people treat, but it is enough to teach us that we still have a lot to learn about treating fractures. We have had some excellent results; we have had many good results; we have had several poor results. I believe firmly that that is the condition of almost anybody's treatment of fractures, that is anybody who has a large number of cases.

One point I should like to stress in the treatment of fractures is the anatomical and the functional results. I can think of nothing better in the treatment of a fracture than that every particle of the fragments of bone should fit in and dovetail with the others as nicely as a carpenter would joint his wood, but you know that is practically impossible except in a very few cases.

Dr. Newell, of Chattanooga, Tennessee, reported 1192 fractures, and he emphasized the fact that functional results are what we want and that we may have them by an approximation of twenty-five per cent of the ends of the bones, or fifty per cent, or all if we can get it, but what we want is functional results. If you get the bone in perfect alignment (speaking of long bones, of course) and get a union, you will have function. If you undertake in every case to go in and get a perfect anatomical junction of the fragments of the bones, in some cases you will have infection, no doubt, and you will always have ankylosed joints and complications and resultant disabilities that you possibly would not have if you endeavored to get a functional result.

If a man has a lack of absolute approximation anatomically and gets well and can play baseball and can work in the mines or in the factories, or wherever he may work, I think that is good.

When I left home we had six fractured femurs in the hospital. We did not have the same appliances on all of those fractures. We treated each one of those fractures, and we are treating it today, as an individuality. I think we

shall all have to treat in the same way; we shall have to take each case as an individual case and treat it that way.

I should like to say something about Dr. Duncan's paper, which I think was very excellent, but I haven't time. I shall be very much interested in the other discussion.

Orville Miller, Louisville: I have enjoyed very much hearing the excellent papers given by these gentlemen who have had so much experience in the treatment of fractures, and I am delighted to hear them and to know the results that have been obtained in these cases by the methods that have been given us.

Like Dr. Howard, I believe that no definite rules can be laid down as to the details of handling any one particular fracture or any group of fractures. Every man must handle his cases as he finds he is best fitted to handle them or in the way he finds he is most capable of handling them successfully. What we mean by successfully is to produce a union or to obtain a union with as nearly normal return of function as possible and in as short a time as can be obtained by any other method by any other man. Some men prefer to open their cases and operate them; some prefer the closed method altogether. We have just listened to Dr. Duncan say that he opens some of them and some of them he treats by the closed method—a combination, in other words, of both the closed and open methods.

During the war, one of the very eminent surgeons in this country came to France and began to open practically all the fractures that came under his care. Very promptly there was an order issued that no more simple fractures should be opened, not because, I think, the War Department doubted this man's ability to handle fractures in that way, but because of the fact that it would not have been very long before every one of the surgeons would have been opening all of their fractures, with a likelihood of a large number of osteomyelitis cases or infection following. An osteomyelitis is a very serious thing, especially if it is developed in a bed that is already prepared for it, where there is an extravasation of blood, a large blood clot, a perfect medium for the development of germs, and especially, as there was in France in the army, where there is a much greater likelihood of an infection from a streptococcus or a hemolytic streptococcus, and consequently a very great danger of loss of life of the patient. There is a danger in the hands of everybody, as a rule, I think, in opening fractures indiscriminately. Some men are more adept at handling the open operation, so we cannot criticize them, but we must judge the results obtained by comparison with the results obtained by other methods by other men.

I was particularly interested in Dr. Todd's report of cases of fracture of the spine, and I should like to ask him if he has encountered in

his work the development of Kummell's disease. We have had a few of those in our practice, and we have found it necessary to do a fixation either by the method of Hibb or by Albee's bone graft in order to relieve the situation. The likelihood of the development of Kummell's disease or of an osteitis of the body of the vertebra comes on because of lack of fixation over an adequate length of time. It doesn't develop in every case, of course, but there is a possibility, and we may say even a probability, of the development of this condition if there is not fixation over a longer period of time. I think very patient should have at least eight weeks of complete fixation, rest in bed on a plaster bed or in a plaster jacket, or something that affords firm fixation, afterwards using some sort of appliance if there is not the necessity of doing a laminectomy or some open operation because of paralysis or paraplegia below the lesion.

These cases have all been very interesting. I find that the cases that give me the most concern, so far as the final functional results are concerned, are fractures of the spine and fractures of the os calcis. Some men have flat-footedly said that fractures of the spine recover completely and are able to do their normal work again within twelve months' time after proper treatment, or they go on for an indefinite length of time, or, if there is a trophic ulcer developing, they will usually turn out fatally within a period of five years. Fractures of the os calcis, as I say, in my experience have been very difficult cases to handle. I should like to know what Dr. Duncan's method of handling that type of case is. We have been doing a tenotomy of the tendon of Achilles, simply dividing the tendon completely and doing a subastragalar arthrodesis. Even with this method we have found that a year's time at least has been required for recovery, and then very frequently with some percentage of disability.

I want to thank these gentlemen very much for their papers. I have found them very instructive indeed.

George A. Hendon, Louisville: I have listened with a great deal of interest and pleasure and edification to the presentation of the subject matter contained in these two papers.

In the management or treatment of fractures, we have three or four cardinal elements to consider or essential facts to remember. The essential points are: alignment, approximation, immobilization, and nutrition. If you get a combination of those four vital functions, you will get union, and you will certainly get bony union and good union.

The whole question lies in the best method adopted to obtain those four objectives. Anybody can analyze in sufficient time what he prefers to do to reach those objectives. There are as many ways to set a fracture as there are ways to set a hen. Every man is entitled to his

own opinion. (By the way, I don't like that term "set" as applied to fractures. We ought to use the term "lock", and that would suggest a "key.")

Dr. Todd made a very significant statement that ought to shed a flood of light on this entire proposition. He referred to the compound comminuted devitalized fractures that are brought into his hospital, with the bones crushed and the soft structures destroyed, reduced to pulp, ground to powder, and they get well without any suppuration. Yet under the same roof men will tell you what an awfully dangerous thing it is to open a fracture in an operating room, with gloves on, with a mask across your mouth, using the greatest care, and they will depict the horrors and the dangers that beset the path of any man who undertakes to open a fracture. They see the compound comminuted, pulpified limbs come in day after day and see them get well without the slightest trouble, and yet they emphasize the terrible risk that one takes in opening these fractures under aseptic surroundings.

The week before I left home, I treated a man who had a compound fracture, who worked in a junk yard. An iron bar had fallen on his tibia and crushed it; it was comminuted; the soft parts were pulpified. We placed those bones in alignment, we locked the fragments together with a key, and that was the only fixation that we used. The man's temperature never went above 100; the soft parts healed kindly; he is now ready to get out of bed. Why should we be afraid to open fractures under aseptic and favorable surroundings?

Dr. Todd refers to the fact that Dr. Sherman has successfully treated one series of 100 femurs with metal plates. That proves nothing. Sampson slew 17,000 Philistines in one day with the jawbone of an ass. Who is going to battle armed with the jawbone of an ass? That does not prove that the jawbone of an ass is a military weapon. We just can't afford to be controlled by that kind of thing; it just won't do; it doesn't prove anything except the incredible resistance of the human frame.

When we begin to talk about the three s's, suspension, splinting, and skeletal traction, and are confronted with the elaborate paraphernalia and the complicated machinery that is used and applied and adopted to fulfill the requirements of those three s's, I can sympathize with David when the king's armor was put on him.

I do not mean to antagonize the old order of things at all, but I do want to remind you that the treatment of appendicitis went through the same process of evolution. We found men who would deprecate with all their force and all their eloquence the operation for certain cases of appendicitis. We remember how we went through the gall bladder period of evolution. We remember the great argument about operating

on gall bladders; the older surgeons were so afraid they wouldn't find a stone that when they did operate they carried one in their pocket. Now when a woman is fat, forty, and belches gas, she gets operated on; the same is true of a man. Those things have all gone through the same period. Cesarean section has gone through it more recently. Just a few years ago women were permitted to travail in labor for days and days, and when it was almost certain they were going to die, Cesarean section was permitted.

The fracture business is going through exactly the same process of development.

I want to say just one more thing in regard to infections that occur in these crushing injuries. Dr. Duncan mentioned the intravenous use of mercurochrome. If you will use the venoclysis outfit that we have demonstrated at the exhibit hall, and give the patient 6,000 cc.'s of a ten per cent solution of dextrose in normal saline within a period of twenty-four hours for 5 or 6 days in succession (that means a little over a pound of sugar per day), it will destroy those infections with the most surprising regularity and the most complete effectiveness that can be imagined.

I. A. Arnold, Louisville: I appreciate the papers of Dr. Todd and Dr. Duncan. They are very timely. This is a day of traumatic surgery especially bone injuries, due to our modern methods of transportation and mechanical labor saving machinery. What are we going to do when called upon to treat suspected fractures? First, apply a temporary dressing to immobilize or as nearly so as is possible to prevent traumatizing in transporting patient.

Second, have an x-ray picture made in two or more places and at the proper angles that you may be able to determine the exact type of fracture with which you are dealing and thus prevent unnecessary manipulation and the misplacement of fragments that had been in fairly good position. In the treatment of fractures, one must consider not only the broken bone but the body as a whole. It was only yesterday, that I saw a case of an old fracture of the femur with shortening and tilting of pelvis to such degree, as to produce extreme pain in back and fatigue upon little walking. However, movement of the leg was not interfered with. Such condition could have been prevented, had the fragments been maintained in apposition at the time of injury. As to treatment, I never make a compound fracture out of a simple one if possible to reduce the fracture and maintain it in good apposition and alignment. Again I never hesitate under aseptic precautions, to open up a fracture in order to obtain perfect apposition and alignment. As to various methods of external fixation, I will say they are all good, if the man understands the appliance he is trying to apply to the patient and not try to fit the patient to the appliance.

As to internal fixation, I will say they are all good if applied to the right cases and at the right time. The Lane's plate is excellent in fractures of the femur where there is sufficient muscular structure to cover the site of fracture. The beef bone peg is also good.

The autogenous graft is unquestionably superior for internal fixation, if however, there is not too much strain at the fracture site. However, it is more preferable if your fragments will dovetail and be retained not to use any kind of material in the bone but rely on external fixation after reduction. In regard to the autogenous graft having osteogenetic properties, I am of the opinion there is not a doubt especially in a massive graft.

Dr. Todd spoke of fractures of the spine. I will say it is difficult sometimes to determine what case should be operated upon. If we have partial paralysis, the tendency is to wait for the case to clear up or get worse. The sooner you operate the less apt you will be to have permanent injury to the spinal nerves. In some cases with total paralysis, you may be able to do some good provided the cord is not cut. If it is you have done no harm as the patient will die.

As to the sacro-iliac strain, I have seen very few, that is the strain of the sacro-iliac joints. I have seen quite a number of the so-called sacro-iliac strains, which in reality, are strains of the lumboiliac and lumbo-sacral alignments. When one stands in a certain posture for a long time, the lumbar muscles become tired, and throw strain upon the ilio lumbar and ilio sacral ligaments, and produce a pain that is difficult to control.

I find that in fractures of the pelvis without injuries to the pelvic organs or viscera, one may expect excellent results although the fragments are not properly adjusted. I am referring to the male pelvis. In case of the female poor adjustment would probably interfere with child bearing.

C. G. Forsee, Louisville: I enjoyed very much both papers that have been presented. In our check-up of disabilities, we find we have made the same mistake that Dr. Duncan has made in estimating the length of disabilities; we have also made the same mistake that he has in giving disability too long as total partial disability. This, I think, is somewhat of an injustice to both sides. These cases usually come before a compensation board, and the compensation board has to depend upon what the surgeons tell them. Most cases that we have estimated with a total partial disability of twenty-five per cent, in the course of two or three years have shown a much greater improvement, and the disability has been reduced to ten per cent, five per cent, or nothing.

Just a few words with respect to the most disabling fractures that we have to deal with. Our experience has been exactly that of Dr.

Duncan and Dr. Miller with respect to fracture of the os calcis. Dr. Duncan did not say whether or not he tenotomized these patients, but we invariably do that. We think there is no fracture which requires immediate attention more than a fracture of the os calcis. If you are going to put these cases up, you must put them up immediately, the tenotomy must be done immediately and the reduction accomplished immediately. If this is not done, you are sure to have some permanent partial disability. The next best thing is perhaps doing an open operation with the idea of fusing the calcaneum to the astragalus.

I heartily agree with what Dr. Duncan had to say about the occupation of the workman. I think in an occupation that requires skill with the hands, the fair thing is to allow the workman more disability than a workman unskilled with his hands.

In fractures of the radius I fully agree with Dr. Duncan's four principles as to the reduction and care of the cases. The first thing is a good x-ray picture. That is absolutely necessary, to my mind, in all fractures, but in fractures of the forearm especially, good x-ray pictures are essential. The next essential thing is anesthesia with complete relaxation. The next most important thing toward reduction of fractures anywhere, particularly in the forearm, is a good fluoroscope. After that comes a check-up with the x-ray.

We have never seen a case of fractures of both bones of the forearm that could not be reduced under the fluoroscope, with three exceptions. They were all in children, and the fractures were about three-quarters of an inch above the articulation of the lower end of the radius. It was impossible for us to reduce them, even though we had the patients completely anesthetized and under the fluoroscope. In one or two cases we tried this procedure in the same patient, and failed.

It is a very easy matter to open the wrist, take a skid and skid the radius back in place, and sew the wound up with ordinary chromic catgut. An ordinary fixation will hold that and give you absolute hyperfunction. You do run the risk, as you do in all open operations, of infection. If you get that, you are in trouble. Fortunately we have not had that experience. As I say, we have had only three cases of that kind.

Another thing which Dr. Duncan brought out which I think is a very important thing in the treatment of cases is to determine what you are going to do, and do it immediately. After you come to a conclusion by the use of the x-ray or the fluoroscope or whatever means you have used as to just exactly what the man has had happen to him, the next thing is to get the condition corrected as well as possible and to do it at once. This thing of temporizing and wait-

ing three or four days or weeks for the swelling to go down so you can fix a fracture, to my mind is a grave mistake.

Another thing I want to emphasize in Dr. Duncan's paper is the apparently bad or dangerous fractures which look like they are going to have perhaps a total disability and often turn out to be the ones that come out the quickest and in which you get a good functional result soonest.

Another type of fracture that Dr. Duncan mentioned with which we have had considerable trouble is fracture of the metatarsal bones of the sesamoid. We have had great trouble and prolonged disability in so apparently simple a fracture as a fracture of the sesamoid.

As to compensation, as a usual thing I think the surgeon by his attitude toward the patient can many times get a patient back to work, and I think perhaps surgeons try to get patients back to work too soon sometimes. You must listen to what the patient says, because after all he is the one who is doing the suffering, if there is suffering. Another factor in this proposition is the money. We have patients come to our office who have three or four industrial insurance papers that we have to fill out every week, and they get more money out of the insurance company than out of their work. We do have a time getting those fellows back to work. Ordinarily I think that a patient has a tendency to get back to work too soon. Of course, with a good many of our cases we are on a salary basis and it doesn't matter to us whether they get back to work in a week or a month; the amount of treatment does not figure in it at all. Most men want to get back to work too soon; they think they are losing time. On the other hand, we use physiotherapy, which speeds their recovery in many cases.

Heat, I think, is the most important thing. Perhaps infra-red has something to do with the recovery of these patients. I think these men will come around and get complete function much sooner if you allow them to get back to work than if you temporize with them and massage them and manipulate and try to accomplish the results yourself. I think working helps.

Fortunately, as we are situated, we have a plan by which we can get men back on what we call light work. That is a very essential thing, particularly in cases of men who have had fractures of both bones of the forearm and cannot do their usual hard manual work. It is unfair to put them back too soon. We have a means of putting them on light work which I think facilitates their recovery very much.

I have enjoyed the paper greatly, and I think the salient point in Dr. Duncan's paper is one we should remember. That is the attitude we should maintain toward the compensation board and toward the patients in handling their cases before

the compensation board.

C. C. GARR, Lexington: Dr. Todd spoke of having some seven or eight cases of fracture of the spine with total paralysis, visceral, sensory and motor. It is always a question whether to operate or not operate in those cases. The only thing a laminectomy can do is to take off bony pressure; it cannot do anything at all to a damaged cord. By the Quickenstedt test we can tell whether or not to operate, we can tell whether there is pressure on the cord. The Quickenstedt test was first used in the diagnosis of spinal cord tumors. A spinal puncture needle is put in the lumbar spine and a pipette attached to it by a rubber tube. The spinal fluid will rise in the pipette, and with respiration the fluid will go up and down about a half to one inch. With coughing or sneezing it will jump way up, so we want to avoid coughing or sneezing. Then by direct pressure over the second cervical vertebra on the jugular vein—not enough to cut off the carotid artery—you increase the pressure in the brain which also increases the pressure of the spinal fluid. If there is a bony block there will be no change in the level of the fluid in your pipette, but if the spinal canal is open, this increased cerebral pressure will show in the pipette by a rise of your inches in the tube.

I have used this test four times and have found it most satisfactory. If there is a bony block, the fluid will not rise in the pipette, hence an operation is very essential because there is a bony pressure or a blocking of some kind and a laminectomy is indicated. If the canal is open, a laminectomy will do no good because there is nothing to do.

Frank T. Fort, Louisville: These papers are too voluminous for anyone to attempt to discuss them completely. I will start my remarks by stating that in my belief a real bonesetter is born and not made. A man has to be a mechanic plus having anatomical knowledge and many other things, judgment more particularly.

Reese was a mechanic. Take a real watch maker or an automobile mechanic and give him a college education and a thorough medical training, and I will guarantee that he will make a good bonesetter.

Nothing was said about the old-fashioned way of treating fractures. I happened to graduate just before the x-ray came in, and was fortunate in spending two years with Dr. D. G. Murrell, who was a natural mechanic, a sculptor, a painter, and the best fracture man I ever knew. The sense of touch in the older man was almost equivalent to the x-ray as used by the younger man.

I believe before any fracture is managed, it is well to correlate the symptoms, to feel of the fracture, to get your orientation, as it were, and then put the patient on the x-ray table, give him an anesthetic if relaxation is necessary, and set the fracture; then look at it with the x-ray and

put on whatever dressing you use.

I remember examining a young fellow several years ago on whom calipers had been used. Whoever dressed that young man took someone else's word for it, put on about thirty pounds, and when he got through the leg was three inches longer than the other leg.

A case was reported in Chicago by an eminent surgeon where there were four inches of lengthening by the use of calipers. I don't condemn calipers, but I think a man who uses calipers should also use extreme judgment in the amount of weight per kilometer of weight.

I don't believe in listening to a paper and then jumping into the use of some method that one has never heard of, without having seen it or investigated it and having determined whether or not one is capable of using that particular treatment or method. One man can use a treatment and get the very best results; another man may attempt to use the same treatment and condemn it.

I think judgment and quick action are very essential. A great deal depends on what you think and what you do in the very beginning. Every case that the emergency surgeon gets he is handicapped in handling because of the possibility of his never having seen that individual before. Each friend and each neighbor has in mind some doctor who is still better. The first important thing is to gain the confidence of the patient and treat him as gently as possible without using undue roughness. In those cases I think it is much better to give a man an anesthetic to get down to the real evaluation of what is to be done. Consider making a friend of the patient as well as being his doctor. I have treated a great many patients whom I had never seen before who referred innumerable cases to me just because I kept that one thought in mind, that I was the individual's personal doctor and it was up to me to make the patient my personal friend.

Relative to fracture of the pelvis, I don't think there is anything better than a Bradford frame. During the war, I had a case of a man whose pelvis had been passed over by a truck. Intuition told me to go in on the left side, and I found a ruptured bladder. The descending ramus was compound-comminuted. I went through the perforation in peritoneum and got out two or three pieces of bone. I put that fellow on a Bradford frame, and in three months he made a complete recovery. I think I had four or five patients at the same time on Bradford frames. I consider a Bradford frame in pelvic fractures absolutely essential.

W. Barnett Owen, Louisville: I can not recall any morning in which I have had more pleasure than I have had this morning in listening to Dr. Todd's paper and Dr. Duncan's paper and the very excellent discussion which has followed.

I was reminded by the various types and methods of treatment outlined that a few years ago

there was so much discussion in the medical societies on typhoid fever, so much on diphtheria. A little bit later on they learned a great many more things definitely about these diseases. There is very little discussion about them now. The fact that there is so much discussion on fractures and that there are so many different methods means that it is absolutely an impossibility ever to standardize a definite method of treating all fractures. It depends upon the man himself, his familiarity with types of fractures, the character of the patient, the age, the condition under which he is treated, and the familiarity of the surgeon with the method selected.

The only difference between contract practice and private practice is that in contract practice you get a definite sum per case; in private practice you get a definite sum per-haps. (Laughter)

There are so many types of fractures considered that I really feel it is useless to attempt to cover any one in particular.

Dr. Hendon is such a humorist that I never can tell when he is serious and when he is telling a joke, but I believe he is getting serious about the principles he advocates.

The discussions brought out by Dr. Howard of Harlan and Dr. Forsee coincide pretty well with my feelings at the present time. I believe still that we should be more conservative, use more judgment, avoiding radicalism, when possible, accomplishing reduction and maintenance of reduction; subjecting the patient to the least danger with the idea in mind of securing function without pain, in the shortest time.

M. H. Todd (In Closing): I should like to mention just one or two points. I was impressed especially by three points in Dr. Duncan's paper. In the first place, he finds that it takes a longer period of time for return of function than the textbooks generally allow. He also finds that the eventual really permanent disability is usually less than he thought it was going to be at first. Dr. Forsee agrees with that.

Dr. Duncan also laid stress on the importance of following up all these cases. That, of course, is the essential thing. You cannot learn unless you do follow the cases.

The third thing that he mentioned, which was concurred in by Dr. Forsee, was the fact that whereas physical therapy, diathermy, heat and massage, are all important, the return of the patient to modified work is very much more important in hastening recovery.

Dr. Howard has treated a tremendous number of fractures, 2500 fractures, excluding fingers and toes, while he has been at Harlan. His work is extremely satisfactory. I have been associated with him in some of the compensation cases brought before the board. His results are extremely good. I think the thing he emphasized is an important thing, namely, that all methods may need be used at one time or another to han-

dle various fractures. It is not possible to limit yourself either to closed reduction or open reduction or to the use of any particular appliance, such as skeletal traction, but you may have to use any one of those things in any particular fracture.

Dr. Barnett Owen said the same thing, saying that it was necessary to suit the treatment to the case.

Dr. Howard's six fractures of the femur probably were all being treated a little differently.

The essential thing, after all, as was emphasized by two or three men, is the function of the patient, whether or not he can return to his usual work and play baseball.

I think Dr. Miller's remark that infection is always a possibility to be thought of in opening fractures is very pertinent, and I should like to say that the technic, for that reason, ought to be as good as it can be. We believe, as far as possible, the Lane technic, as strictly as you can do it, should be used, and with practice it really is not necessary to get your fingers in the wound at all. You can tie knots with clamps just as speedily as you can with your fingers, with a little training.

I used to think that Lane technic was necessarily a very slow, laborious, puttering sort of procedure. It isn't at all. It can be very rapidly and skilfully done if you practice at it.

In reply to Dr. Miller's question about Kummel's disease, as I said in my paper, we have found it necessary thus far to do bony fusion in a single case of compression fracture of the spine. We do, however, keep the case in bed a long time, just as he said, and as a matter of fact nearly all of those cases wear a brace for eight or ten months or a year, if we can keep them wearing it. A good many of them throw the brace away and say they don't need it, but we try to make them wear it. We generally grant them probably ten per cent bodily disability in compensation, and having made a money settlement they go ahead and do their work without any trouble. Whether Kummel's disease develops later I do not know, and I am not trained enough in orthopedics to know how long that might take.

Dr. Hendon believes that the steel plate is an insult to the bodily tissues and that the body welcomes the little bone key and closes around it with no reaction at all. I agree that it would be better to use bone rather than steel, in a general way; on the other hand, sometimes the steel plate appears easier to put in than the bone plate. I have not used the bone peg and have had so little experience I am not qualified to say. I believe the main part of Dr. Hendon's work is that he does not confine the injured member with external fixation after his operation has been done. It seems to me that is a very important thing. He allows a little motion. You think he allows a little motion at the fracture, and maybe he really

does, but I have no doubt his method of avoiding constriction is very good.

I would not go so far as he has gone in saying that the majority of fractures ought to be operated on. I deprecate that point of view. I believe most of them do not need it. We have used open reduction in a relatively few number of cases, not more than five per cent. Most of them are perfectly amenable to the closed method.

Dr. Arnold emphasized a thing that I should like to comment on; that is the fact that you should have x-rays, as perfect x-rays as you can get, in all cases. We have at present in the hospital a fractured femur. It showed a transverse break in the middle of the shaft, and we opened this man because we could not get it in alignment any other way, and put a good, heavy Sherman steel plate on. The patient went back to bed, made a little motion, and broke his femur right above the plate. What happened was that there was an incomplete line of fracture that we had not noticed in our slightly imperfect x-ray, that extended nearly to the cortex. The patient went back to bed and did not break the plate—the plate is still holding a useless fragment of bone to the lower fragment, and the upper fragment is loose. Fortunately we were able to get it back by simple traction, because we had gotten it in good place. It shows the importance of having taken perfect x-rays. We should have had a perfect x-ray in the first place and demonstrated the fracture line.

I agree with Dr. Arnold in my own personal opinion, which is limited to a small number of cases only, that if you are going to do a laminectomy it is probably better to go ahead and do it early. We have watched several cases that had an incomplete though quite severe paralysis of the legs after spine injury. Their end results were extremely poor. They got so they could walk, but they certainly did walk poorly. They limped along with a couple of canes, and I don't think the end results were at all good. I believe if I had a broken back I would be willing to take a chance on a good surgeon doing a laminectomy, though I realize the danger of the operation.

Ellis Duncan (In Closing): I was impressed with what Dr. Todd said about difficulty in fracture of the clavicle, in getting satisfactory union, because I have had such difficulty more than in the average case, it seems to me. It has been, in my experience, very difficult to satisfactorily immobilize a fractured clavicle for a long enough time to get good, solid, safe union, and I have had delayed union in a good many of these cases. I have one case on hand now that is in its eighth week and in which yesterday I got crepitus when I tried manipulation. This was an exceptionally tractable patient who was not nervous at all and in whom I thought we had an ideal case for satisfactory immobilization. I have

had that experience in quite a number of fractures of the clavicle, and it has caused me to be particularly careful in my efforts to obtain perfect immobilization and to keep them immobilized a long time. As to the treatment of fractures of the os calcis, I have examined a great many of these cases for the Compensation Board or for insurance companies, to determine the degree of disability, and frequently to make a diagnosis—cases in which diagnosis had not been made. In my own cases I have never resorted to any operative measure other than trying to "mould them up" and put them in a plaster cast, usually not longer than three weeks, but I am convinced that in all those cases in which the subastragalar joint is invaded, an arthrodesis would shorten the period of total disability and lessen permanent impairment.

The question of accident insurance policies which the injured man may have sometimes has a considerable practical bearing on the length of time of the temporary total disability. I had one man who had a break of three metatarsal bones, with a considerable displacement of the distal fragments, fracture of the left cuboid bone in the same foot, and fracture of the clavicle on the opposite side. He had several policies that he collected on, and his company employed the plan of paying him full wages instead of letting him accept the compensation (which was less than full wages). It therefore turned out that he was making between two and three times as much money when he was laid off as when he was working. I had great difficulty in getting him back to work. My estimated total disability was ten weeks, and I think that was enough. We got him back in fifteen weeks and then had to get the compensation board to help get him back. He was allowed a permanent impairment of ten per cent of his foot. That was the only impairment that he had. As a matter of fact he has lost no time since he went to work, doing the same work at the same wages, and his permanent impairment at present is three per cent of his foot. I am glad when these men have something to fall back on. It is an important thing that they should have, because compensation is not enough to support them, but if they get too many of these policies, you have a lot of trouble getting them back to work. Light work is very important, and a factory which will employ the policy of getting a man back to some work he can do just as quickly as possible is doing a very sensible thing. It gets the man out of the habit of loafing, and it prevents a change in his mental attitude that interferes with his getting back to work.

Whenever a fracture comes in I try to make a diagnosis and make a memorandum of it before taking the x-ray, and then check up with the x-ray. I believe that is good practice. I merely mention that on the side. I won't say how many I have hit. I have seen and treated about 1200

fractures in the last nine years.

In doing traumatic surgery, attention should be paid to complete office equipment, with a view to taking prompt and adequate care of emergencies, and to doing a certain amount of emergency surgery in the office, both under local and general anaesthesia. It is well to have one of the rooms in your office fully fitted for minor surgery under a general anaesthetic, because you are going to have to use, nowadays, in traumatic surgery, a general anaesthetic in your office a great many times. The majority of fracture cases can be handled in this way, without the necessity for hospitalization.

VERSION: INDICATIONS, TECHNIQUE*

By HENRY M. RUBEL, M. D., Louisville.

It is my desire to bring to your attention today what is probably one of the oldest obstetric manoeuvres in the whole category of midwifery. From the most remote days, and assuredly probably as ancient as the human race itself, operations for the relief of the parturient woman have been resorted to. Even before Hippocrates' time obstetrics seems to have been practiced with a surprising degree of skill. In the very early days the management of the normal cases seems to have been in the hands of midwives. It was only when the dark clouds of trouble loomed upon the horizon that the male accoucheur was sought, to save if possible the life of the child, and at times both mother and child.

A Treatise on Midwifery and Gynecology, written in the second century by Soranus, gives in detail directions as to the best procedure in difficult and abnormal cases. One is impressed by the skill and broad experience manifested by the writer. From his writings one must assume that Soranus used podalic version in the case of a living child, and that his help was humane.

Many writers, from time to time, have mentioned this procedure only to have it fall into disfavor, then seemingly lost for ages, then again favorably brought to the notice of the profession by Ambroise Pare, in 1550, who described and successfully performed version.

Pare's description of pedalic version seems to have been most original, and certainly appears to have been of French origin, and to have had its birth among the barber-surgeons of Paris. His method was practiced and improved upon by his pupil and successor, Jacques Guillimeau, who seems to have been the first obstetric author to advocate pedalic version in cases of placenta previa.

And so we run the gamut of outstanding obstetrical figures through the centuries, per-

suing their teachings, seeing their results noting their bickerings, deportment and jealousies, until one feels as though there is nothing new after all.

The French surgeon, Jean Louis Baudelocque, was an outstanding obstetrical figure whose *L'Art Accouchements* ranked as the standard obstetrical treatise on the Continent and in England for a century. His views on the technique of version are set forth in great detail. The woman must be laid on her back, as horizontal as possible, the breech being placed at the edge of the bed, so that the coccyx and perineum may be free, the thighs and legs half extended, and the feet supported by assistants or resting on two chairs properly placed.

Wigand, in 1807, introduced external version, demonstrating that the position of the child could be easily altered by manipulations through the abdominal walls. This has become a well established procedure in certain conditions.

Such names as Simpson, Braxton-Hicks, Wright, Goodell, Cameron, Veit, Smellie, and a host of others show conclusively that a world of thought and consideration was given to this method of delivery. Naturally this method met with serious opposition whenever it was introduced and re-introduced. I say re-introduced advisedly, as this procedure would seem to run a certain length of time, apparently relegated to the scrap heap of obsolete methods, and then suddenly make its appearance again amidst great acclaim, and then gradually die down once more, after withering criticism and acrimonious debate silenced those responsible for its introduction.

Assuredly this manoeuvre is a meritorious one, a life-saving one in many instances, a time and pain-saving one in the greater number of instances, and one which I am positive will never be forgotten and used only as an emergency measure. Naturally obstetrical leaders are not agreed upon version as a panacea for the delivery of the child in the great majority of cases, and when occasionally a figure looms upon the horizon and disagrees with these leaders, a mighty interesting controversy follows.

VERSION.

Version, or turning, is an operation through which the presentation of the fetus is artificially altered, one pole being substituted for the other, or an oblique or transverse being converted into a longitudinal presentation (Williams). Bringing the head downward is termed "cephalic", and when the breech is brought downward it is called "podalic." If we speak of external version, we mean that all manipulations have been made through the external abdominal walls; of internal version when the entire hand is introduced into

*Read before the Kentucky State Medical Association at Richmond, September 10, 11, 12, 13, 1928.

the uterine cavity. Combined version then, being a combination of the above, is self-explanatory.

INDICATIONS.

Cephalic version may be tried in either a breech or a transverse presentation in the latter weeks of pregnancy. This may be accomplished by external manipulations, and if no disproportion exists between the fetus and pelvis, version is at times readily accomplished. Again, after external version is attained, there is a tendency to a spontaneous return to its original position. I do not believe any form of bandage, adhesive plaster, etc. can possibly hold the fetus in a corrected position after it has once been accomplished. Bimanual version may also be resorted to in transverse presentations.

PEDALIC VERSION.

Transverse or oblique presentations: Head presentations, where delivery can be accomplished with a greater degree of safety and speed. Where the face, brow or occiput is posterior and movable above the superior strait, delivery can frequently be more readily accomplished by version. Prolapse of the extremities or funis. Placenta previa, except in primiparæ with undilated cervix and where there is a complete placenta previa. Here cesarean section is likely to give a better result. When the head is floating at the superior strait, or only slightly engaged, and prompt delivery becomes essential, version is indicated, providing, of course, no unusual disproportion exists, between its size and that of the pelvis. Pre-eclamptic toxemia and antepartum hemorrhage after cervical dilatation has been accomplished by means of the hand or bag.

Quoting Potter, who work along this line is evolutionary, numerous other indications could be added, to-wit:

(a) Absolute or partial cessation of pains, with dilatation of the os more or less complete: uterine inertia.

(b) Pendulous abdomen, where the exertion of the uterine force is not in the direction of the axis of the birth canal.

(c) Varicosities of vulva, vagina and thighs, where there is danger of the veins breaking down and becoming infected during a long drawn-out labor, causing serious puerperal complications.

(d) Moderately contracted pelvis.

(e) Shoulder presentations, hand and cord presentation.

TECHNIQUE.

As this is a major operative procedure the usual surgical methods are employed with every aseptic precaution as is used in our best surgical services. This is the most important consideration as, according to statistics, more women between the ages of fifteen and forty-

five years die of puerperal sepsis than any disease except tuberculosis.

The intestinal tract having been cleansed with castor oil or an injection some hours preceding delivery so as not to soil the field during labor, the patient is now prepared as for a major operation, shaved, scrubbed and made as clean as possible. Here, it has been my custom to resort to the use of a five per cent solution of mercurochrome, following in a measure the method of Dr. Harry W. Mayes of Brooklyn, N. Y. I now paint the external genitalia and introitus with a five per cent mercurochrome solution, and lastly instill one or one and a half drams of the same solution into the vagina with an aseptic syringe.

The operator's hands are washed and sterilized with the same care as for an abdominal section. He is gowned with either a short sleeved gown or one that has a stockinet connection extending from the elbow downward half way to the wrist, so that when the elbow length gloves are drawn on the gloves will have a tendency to fit well on the arm and not slip downward.

POSITION OF PATIENT.

The modified Walcher position with the legs held by assistants on either side is the position chosen. If no assistants are available the legs are supported on two chairs while the operator stands between them. Do not have the patient placed with the feet in stirrups or with the legs in one of the various mechanical supports with which some of the newer tables are now being equipped.

Catheterize the patient. Many have eight or ten ounces of urine in the vesical cavity no matter how often they have voided.

Anaesthesia: The patient is anesthetized to the surgical degree. Chloroform properly administered to the surgical degree prevents injury to the perineum and soft parts. I have recently used ethylene gas with oxygen and find it most efficient in the majority of cases. Some operators are still cautious about the use of this gas due to its peculiar explosive habit. I think with the usual precautions as followed by the regular anesthetists this phase has been safely bridged and that it is a safe gas to administer if these simple rules of safety are followed.

"Ironing out" of the vagina and soft parts is next in order. The gloved finger well lubricated with green soap is now introduced into the vagina as high as the cervix and then withdrawn with a steady and continuous pressure. Now two fingers are inserted and the manœuvre repeated. Then three fingers introduced and finally the closed fist until all rugas and folds of the vagina are completely "ironed out."

Now the cervix, if not already completely dilated, may be gently stretched with the

fingers.

The out-stretched hand, and I always use the left hand no matter in what position the child may be, is pushed upward between the uterine wall and the membranes and the latter gently separated by sweeping the fingers of the hand upward and around, but not coming too near the placenta. A towel is now placed about the wrist to catch any amniotic fluid which might escape when the membranes are ruptured. The hand now explores the uterine cavity, the size and position of the child determined, the location of the cord is ascertained, and the pelvic diameters are estimated.

Both feet, whenever possible, are grasped between the first and middle fingers of the left hand. If the feet are locked at the fundus, disengage, bring one downward, then reach for the second foot, and grasping both between the fingers, and with little traction begin the extraction. The feet are now brought downward to the vulva, the body having rotated, with this movement. Occasionally it becomes necessary to lift the head out of either iliac fossa, with the right hand. The traction is continued until the knees are exposed, and at this time we say the version is complete.

After a slight rest period gentle traction on the anterior foot and leg brings the pelvis of the child into view. The pelvis is rotated in the opposite direction and finally delivered in that direction. The back of the child is finally transverse to the pelvic outlet. If the cord is free and loose at this stage no attention is given it, but if short and tight, double clamps are applied and the cord is divided. No undue haste is allowed at this stage, for by so doing serious complications, such as extension of the arms and of the head, are very apt to take place when the natural forcing powers are interfered with.

What I deem the most important step in the delivery of the child is the method advocated by Potter of delivery of the scapulae, as with the shoulders safely delivered and out of the way all else becomes of secondary importance.

The scapulæ should be thoroughly exposed and brought well into view before an attempt is made to deliver the shoulder. The first finger of the left hand is placed in the axilla and the scapula rotated under the pubic arch, and by means of that the shoulder and arm are allowed to deliver themselves. The forearm is lifted over the chest and delivered in that manner.

With his hand over the exposed shoulder and chest the operator rotates the child's body so the posterior shoulder becomes the anterior one and is delivered as such. The lower arms

usually follow delivery of the shoulder and forearm and rarely cause trouble. Some operators still bring down the arm in a posterior position which I do not advocate as it often causes trauma and extensive tears to the perineum. If the cord is found about the neck several times, it must be released by loosening, and if too tight cut and clamped, and delivery then hastened. Usually no trouble is encountered and delivery follows without undue haste.

The index and middle fingers of the left hand are now inserted into the child's mouth, and with the right hand gentle pressure is made on the occiput over the pubes to aid in the flexion of the baby's head and to direct its passage through the pelvic canal. Do not pull upon the jaw, as a fracture may reward your good intentions. Do not make pressure on the head from above until the arms have been delivered, otherwise this might cause the arms to go upward, also causes chin extension,—complications not sought for at such a time. With the baby's mouth exposed the mucus may be milked out of the throat, and usually the child will begin to breathe. The head may be left in this position until the vaginal structures are well dilated and delivery of the nose and brow follow in an extremely flexed condition, being assisted by lifting the body forward and upward from the perineum.

The baby is placed on its right side across the lower portion of its mother's abdomen with its head in a dependent position and allowed to remain until the cord ceases to pulsate. The cord is now ligated and divided and a hypodermic of pituitrin (1 cc.) given intramuscularly. The placenta is delivered in twenty or twenty-five minutes, or the third stage can be completed immediately if any such haste should be warranted, by doing a manual extraction.

After the birth of the child, Potter seems to be most indifferent as to the child's breathing, but he has demonstrated that nearly all babies breathe spontaneously when let alone provided the heart is beating. Rough handling of the baby after birth is not considered good practice. A catheter attached to an aseptic syringe and the mucus aspirated is excellent for delayed respiration. The mucus is usually wiped from the nose and throat as soon as feasible.

Pressure upon the mother's abdomen during delivery of the head should be avoided on account of injuring the bladder or lower anterior uterine wall.

Many operators resort to the delivery of the after-coming head by application of forceps, and I think this is becoming more of a routine practice than heretofore. No difficulty

should be encountered unless the head has been jammed into the oblique or transverse position, which could be corrected manually, and then the forceps applied.

I have taken some pictures showing this method of application and will show the slides after finishing the paper.

Occasionally the humerus, tibia, femur or clavicle has been fractured during version. In my private work I have had two greenstick fractures of the right clavicle and one case of shock following extraction, which caused me several hours of anxiety, but the patient finally made an uneventful recovery. I have never had any maternal mortality, while the fetal mortality has been within normal range.

The whole idea is not to let the adverse opinion of centuries mitigate against your judgment in resorting to this valuable method before the favorable moment has passed. Do not wait to employ version in only extreme cases. I am certain that some of the dangers associated with version have been unduly emphasized, whereas if employed early would have resulted favorably to mother and child. The pains of the second stage being entirely obviated, the suffering and dread of childbirth is lessened and the woman goes into succeeding pregnancies with a heightened morale knowing that her pains will be only of minimal importance. With version, the vagina, perineum and soft parts are not subjected to the long-continued pressure and stretching of a second stage labor, and cystoceles, rectoceles and gaping vagina are only occasionally the results seen.

Like all advances, version has been subjected to sharp, relentless and bitter opposition by those who object to its being done as a routine procedure, but those who have been so fortunate as to observe the work of Potter have usually come away enthusiastic and converted to its early application following in detail his technique. It is quite a fascinating study and I am sure does not require such a long technical training as some of its opponents would have you believe. I do not know of any case of rupture of the uterus in any of our hospital patients although it is so frequently mentioned in text books. Naturally version should never be attempted when the uterus is tetanically contracted and where the amniotic fluid has drained away. In the presence of a contraction ring with undue stretching of the lower uterine segment, version at this stage would undoubtedly lead to a ruptured uterus.

I want to ask your indulgence for about five minutes following this paper, as I desire

to throw some lantern slides on the screen so as to have you visualize the various steps in this technique.

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THE MANAGEMENT OF NORMAL LABOR.*

By A. F. FINLEY, M. D., Madisonville.

The question arises as to what is considered a normal labour? I have always considered it normal when the mother is in good physical condition and the fetus viable, and in apposition where birth can be accomplished spontaneously, at least we expect a normal labour under these conditions. There might arise some complication even then, such as placenta previa, or uterine inertia, and it is well to be on the alert at all times. Certainly it is not considered normal if the head is out of proportion to the pelvic outlet; the same is true when the mother is suffering from some acute or chronic disease.

A normal labour is the easiest possible labour and is, therefore, the condition to be desired. A great many of the complications can be avoided if proper pre-natal care is given: the toxemias of pregnancy can absolutely be prevented, but unfortunately those of us doing work in the country and in the smaller towns do not get proper cooperation from our patients, and in many instances do not know of the pregnancy until we are called to deliver her. We appreciate the importance of a thorough physical examination—urinalysis, blood pressure readings, routine Wassermann's, iodine therapy, and the importance of physical exercise, but I doubt if we impress upon our patients the necessity of these things. The women of the country are becoming better informed in these matters and are demanding more attention. We who are in the country and smaller towns are at some disadvantage, but statistics I think show that we get just as good results as anyone. I think it is possible to do good obstet-

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rics in the homes, but it certainly is not as convenient.

Assuming that the mother is in good physical condition, that she has had prenatal care, it is nevertheless important to take the temperature and pulse rate and to note the presence or absence of oedema, to inquire as to vision—eclampsia comes like a bolt out of a clear sky sometimes. The next step then is to determine the position and condition of the fetus; careful palpation of the abdomen and location of the fetal heart will be of assistance in determining the position, and the fetal heart rate will give you the condition of the baby.

The next step is the preparation of the patient, and my plan is as follows: Have the bowels moved with a soapsuds enema, after which the pubic hair is removed with a safety razor; a general bath is given, and the external genitals, abdomen, thighs and buttocks are scrubbed with green soap and rinsed with sterile water. The patient is given a sterile or freshly laundered gown and put to bed between clean sheets. I then make an application of a one per cent solution of mercurochrome to the external genitals and anus. I do not as a rule use a douche or any other application within the vagina. I am of the opinion that our greatest source of infection come from without.

In the homes I see to the sterilization of my rubber gloves and instruments, which includes scissors, tape, uterine dressing forceps and instruments for repair of perineal lacerations. After scrubbing my hands as for a surgical operation, I put on a gown and rubber gloves and make a vaginal examination, being careful not to contaminate my glove before entering the vagina. I try to determine the position of the fetus, not being satisfied with a "Head" diagnosis, as I think hurried examinations are responsible for most of our mistakes. Having satisfied myself that I am dealing with a normal situation, I pursue a policy of "watchful waiting", determining the progress of labour by abdominal palpation and rectal examination. Frequent vaginal examinations are a mistake. Someone recently said that soap, water, a safety razor, rubber gloves and patience made good obstetrics, to which I agree.

When I began the practice of obstetrics it was customary in our community to sit on the side of the bed with one hand on the knee of the patient and the fingers of the other hand in the vagina supposedly assisting the patient, and join in a chorus with the kind old ladies in admonishing the patient to "bear down to her misery."

It was considered absolutely indecent to expose the patient in making a vaginal examination—examinations were made under a

sheet. Even now some patients expect you to make frequent examinations, believing that it assists or hurries the labour. I wonder, however, if we have progressed very much in the past twenty years in this branch of the profession. There have been some advances, the introduction of rubber gloves being probably the greatest, and it is true that a greater number of women are getting prenatal care, but in this age of hustle I wonder if we as physicians have not gotten in a hurry with our obstetrics. The general practitioner is as a rule a busy man, and this work interferes with his regular work, at any rate he does not as a rule, like this branch of the profession, and that very thing I fear is responsible for many mistakes in obstetrical management. He has not the patience that he should have, is anxious to be about his calls, and makes frequent examinations, sometimes resorting to the use of pituitrin in order to get through, and frequently at the expense of his patient's well-being. Pituitrin has its place in the practice of obstetrics and that is usually in the third stage of labour. It is my opinion that this drug is probably doing more harm than good and should not be considered an advance in obstetrical management.

During the first stage of labour I give morphia for the relief of pain, repeating when necessary. I allow my patients to do as they please,—walk, sit or recline at will. Also during the second stage I use morphia if necessary, and for the completion of the second stage I use ether anaesthesia. I formerly used chloroform, but find ether just as satisfactory and less dangerous. Gas-oxygen anaesthesia is not practicable for use in the homes, but from my information I think it should be the ideal anaesthesia for obstetrics. However, I have had no experience with it.

After the head is born I examine to see if the cord is around the neck, removing it of course if it is. After the delivery of the baby the eyes should be cleansed and mucus removed from its mouth as soon as possible and one per cent silver solution instilled into the infant's eyes. Usually I wait for the cord to cease pulsating before ligating and severing it. The baby is then turned over to the nurse and the same technique of cleanliness is continued in the care of the infant, using a sterile dressing for the umbilicus.

Third Stage: Unless there is hemorrhage, I see no reason for being in a hurry for the delivery of the placenta. The mother is tired and will appreciate rest. It is certainly a mistake to make traction on the cord or to try to express it before it becomes detached. Usually it becomes detached in thirty or forty minutes and can be easily expressed then. Hemorrhage is the only indication for manual removal of the placenta, and that only

when all other methods have failed.

With this stage completed I give fluid extract of ergot one drachm, and one-half cc. obstetrical pituitrin. The wise doctor then looks for perineal lacerations, and he is usually rewarded for trouble. In event of lacerations, it is my opinion that immediate repair should be done. This can only be done well if the patient is in proper position, with the parts well retracted and a good light.

Post-partum care is of great importance; absolute cleanliness, rest and proper diet, and care of the breasts are important. I give small doses of ergot T. I. D. for a week and have the patient lie on her face and abdomen for ten minutes twice daily. I think that the use of a commode beside the bed is permissible with uncomplicated cases.

I find that there is but little to be said to do in a normal labour, the preparation of the patient, hands off and patience are the important things, keeping in mind that labour is a normal physiological process and terminates favorably in most instances when left alone. There are some things being done in many cases that should not be done. Do not be careless in making vaginal examinations, the preparation and pre-natal care might go to naught with one careless examination. Do not, as a rule, use pituitrin in the second stage of labour. Do not make traction on the cord, or be in a hurry to deliver the placenta.

It is not possible for general practitioners to acquire the skill of the specialist in this field, but it is possible for us to avoid the grosser errors; it is possible for us to do better than we have done and if we will only do our best, the morbidity and mortality rate would be very much lowered.

DISCUSSION.

L. C. Redmon, Lexington: It has been a pleasure to hear these very interesting papers. I had come to the conclusion that the Kentucky State Medical Society had become an orthopedic society until this afternoon.

Dr. Rubel has very clearly refreshed our minds about version, a very important obstetrical maneuver, quite important as an emergency maneuver.

We did not have any definite technique as to version until the distinguished Dr. Potter of Buffalo gave it to us. The method is certainly very simple, very complete, and the technique is wonderful. If you have had the pleasure of visiting Dr. Potter and seeing him do a version, you will at once admit that he is a master.

Of course, we don't agree with him that all babies are to be delivered by version, not to any extent. I don't think anybody doing obstetrics does agree with him in that, but by doing as many versions as he has done, he has developed a technique that is practically perfect.

I know of no subject that is quite as import-

ant to the general profession throughout the state as the discussion of the care of a normal labor, in view of the fact that the vast majority of labors are normal. I can only discuss it by telling exactly how we conduct our normal patients. We send them to the hospital, the field of delivery is properly prepared, as any other surgical field would be, the lower bowel is emptied by an enema, and the progress of the labor is noted after having carefully rechecked our patient by physical examination and pelvic measurements. That may not be of very much value in most cases, but in some cases may give us some very definite information.

Then the progress of the labor is noted by the nurse and by the doctor, and there are very few examinations. I am not trained to rectal examinations, therefore I have to subject my patients to vaginal examinations, under very careful aseptic precautions.

As the progress of the labor advances, the patient of course is moved into the labor or delivery room and normal labor conducted.

Very few examinations are necessary, I think, to tell whether the patient is making progress. I have been able to tell by the character of the contractions and the manner in which the patient handles the contractions.

Our usual routine is, after so many hours of labor without progress, to relieve the patient's pain for a time with a quarter of a grain of morphine. Then she is allowed to rest, and as the pains re-establish themselves, many times they will change from a first to second stage type of pain and examination will show you that the patient has progressed into the second stage and the delivery begins. If she does not make progress, sometimes we repeat the morphine for a second time, and after dilatation is complete for an hour and a half or two hours and the patient remains in second stage of labor without progress, we deliver by low forceps, assistance.

I was very glad to hear Dr. Rubel say that he does not use the usual stirrups that come along with the modern delivery room table. They are of no advantage whatever because they decrease rather than increase the diameter of the pelvis. I like to have sufficient assistance to hold the legs in the proper position.

I am still using chloroform. It has been condemned by lots of obstetricians, and my associates in Lexington tell me about the danger to cases with the use of chloroform. I like chloroform for two or three reasons. It is simple to administer, and the stage of the anesthetic can be very definitely controlled. There are many times when I don't want a surgical degree of anesthesia. I want primary anesthesia for a time, and then surgical anesthesia, and the patient recovers very rapidly from the anesthetic. I don't like ether because of the delay and the long convalescence from the anesthetic afterward.

I have no use for pituitrin in obstetrics except to control hemorrhage. I see no reason for it with the modern methods of delivering the baby, version, for instance, low forceps assistance, or any other type of delivery that can be done under proper aseptic conditions. There is no reason that I can see for us to take a chance. I will admit that it will work in multiparous cases if there is the proper proportion between the presenting part and the pelvis of the mother, but we don't always know that condition exists, and we certainly will get into trouble if there is a disproportionment.

The use of a long glove in doing a version is of great assistance as well as a great protection to our patient, as it is much easier to pass a long gloved arm up into the uterus than it is to pass an arm with short gloves and the rest of the arm covered with some sort of stockingette as the sleeve of the glove.

G. G. Thornton, Lebanon: To the general practitioner these papers that have been read have been of much more importance than some of the papers on fractures, for the simple reason that out of the 60,000 babies delivered in Kentucky every year, probably about 57,000 of them are delivered not in hospitals, not by specialists, but by general practitioners. Therefore, these papers are of special importance to us.

I want to say so far as version is concerned that I have never attempted external version. I have done all kinds of version by the bimanual method, but I never think of doing a version where the head is presented and where I could get hold of that head with the forceps, for the simple reason that the after-coming head would probably mean the death of the child.

I was particularly struck with one of the papers in which the gentleman advocated that where the after-coming head was delayed in delivery, the cord should be cut and tied. In my estimation that would absolutely obstruct the placenta circulation, and if the head were not delivered speedily the death of the child would be almost certain.

Right here is where I would say, when the breech is presented, that a dose of pituitrin to give a little more of the vis a tergo to expedite the delivery of the after-coming head as a lifesaver.

While I am on this subject, I want to say that while pituitrin has its limitations, I don't know of any real honest-to-goodness remedy that hasn't its limitations. My idea is to shun the dangers but to take the things that are valuable and use them.

In a case of inertia where the cervix is entirely dilated, where everything seems to be favorable, where the pains are present, but impotent, a dose of three or four minims of pituitrin can only do what nature seems inadequate to

do, and cannot result in any harm that I can see or that I have ever seen.

In regard to the danger of chloroform, I just want to say that I have never seen any in my obstetrical practice and I would appreciate it very much if there is a gentleman present who has had any adverse experiences with chloroform in his obstetrical practice if he would let us see his hand. Not seeing a hand I feel it is the unanimous verdict of this Association, that in this line of practice it is to all intents and purposes free from danger.

J. S. Lutz, Louisville: I enjoyed the papers very much. Dr. Rubel says he uses the same hand for the position of the child. It seems to me it is more convenient to get hold of the foot and follow the contour of the child and also as the hand enters the vagina you can give the head just a little push with the hand as you go in. I know Dr. Rubel has done a great many of these and has been very skillful in doing it.

I want to say one word about pituitrin. I think that pituitrin is the most abused drug we have in our whole armamentarium. The man that is so rushed for time that he doesn't realize that he is going to cause traumatic trouble to the baby and that baby's life by hurrying up labor with pituitrin, he shouldn't practice obstetrics. I believe that half of our still births or nearly that many are caused by the injudicious use of pituitrin, giving it before the time, and many, many babies have paralysis of the face and muscles and different parts of the body, caused by giving pituitrin too soon.

Dr. Davis at the Lying-In Hospital in New York, will not allow a dose of pituitrin given the mother before the uterus is entirely empty. He does not allow any of his internes or the house surgeon to give it. I don't know whether he is right or not. We all give it. I give it too, but I don't want a malposition of that child, and I want a complete dilatation of my cervix before I give pituitrin.

Henry M. Rubel (in closing): I have some charts here of cases delivered at the City Hospital which are tabulated.

I am very much chagrined at the report. We had eighty-three mothers delivered. We had four sets of premature twins. We had eighty-seven children, and lost practically 33 1-3 per cent. I stayed up all last night trying to alibi that report.

The four sets of twins were all premature. They ranged from three and a half to four and a half pounds in weight. I think two of them lived. That can't be held against the operation of version. We had a number of children who were non viable before version was attempted, following pre-eclamptic toxemia, prolapse of the cord, and placenta previa, etc.

After I went over the report I finally got it down to about fifteen to seventeen per cent of

the cases that were lost during version. That gives you a group of versions on a service of three obstetricians, Dr. McConnell, Dr. Pickett and myself are on that service. Occasionally the resident and the assistant resident are allowed to do a version under supervision of the staff.

The trouble is that our versions are not clean, straight-off-the-bat versions. Some are cases sent into the City Hospital after attempts at delivery on the outside have been made.

The indications for interference: placenta praevia, partialis, marginalis and centralis, arm in the vagina, slow second stage, prolapsed cord with complete dilatation, no progress, increasing fetal heart rate. Prolonged labor with no progress, either R. O. A., R. O. P., or L. O. P, Abblation Placenta, face presentations, shoulder and chin presentation, arrest at inlet with complete dilatation. Multiple pregnancy and demonstration cases under the supervision of the attending obstetrician.

We do that every now and then to demonstrate to our house staff how to do versions. In all version cases we usually take cases like para two or three, with nice normal measurements, where we can't have a slip-up, just to demonstrate to our house surgeon and the two internes under him just how to do it. In all those cases that are demonstration cases, you will notice no child was lost.

The types of pelvis: normal pelvis in 58 cases, generally contracted in 3, funnel and slight flattening in 18, rachitic in 1.

Positions encountered: Right occipital posterior in 28 per cent of the cases. This agrees pretty well with the findings of Dr. Bill of Cleveland, who has a specially constructed instrument with which he does all his rotations, because he claims that he finds R. O. P.'s or L. O. P.'s in thirty-five per cent of his cases. The list stacks up pretty well with his findings.

R. O. A., 12 cases. L. O. A., 24 cases. And L. O. P., 4. Two obliques, 5 transverse, left sacroposterior, 3; left sacro-anterior, 1. Right mentoposterior, 1; shoulder presentation, 2; chin, 1; arm, 1; unclassified, 4.

In regard to answering the question of lacerations. Dr. Potter says he gets fewer lacerations by doing versions. In going over the 83 cases we find no lacerations in 57 cases. First degree lacerations in 14, second degree lacerations in 5, third degree in 3 cases. That speaks extremely well for versions.

That gives you in a hurried manner a rapid survey of all the cases I have charted. Occasionally on the outside we have heard of cases that have been in labor a long time say a transverse presentation with a protruding arm, and you have to do a craniotomy. Occasionally we get fractures, as I said in my paper, of the humerus, clavicle, tibia, fibula. Recently I heard of one child who had been delivered by

version, weighing five and a half pounds, who had a fracture of the upper 1-3 of the femur. They are easily taken care of and should rarely cause any trouble as far as treatment is concerned.

Version has a definite place in obstetrics, but should not be resorted to in all cases. I believe we should consider wisely the advisability of doing versions on primiperae with rather small measurements and not knowing definitely the size of the child. If all of our versions were done on multiparae we would resort to this manoeuvre with greater frequency and a much lighter heart, knowing in advance that our foetal mortality would be materially diminished.

A. F. Finley (in closing): I want to thank you gentlemen for discussing my paper. It seems that we are all pretty well agreed as to the management of a normal labor. That leaves but little to be said in closing the discussion.

Our results in this branche of the profession have not been as good as they should have been, and that prompted me to select this subject, hoping that it would stimulate us to do better.

TULAREMIA.*

By C. N. KAVANAUGH, Lexington.

In Kentucky the seasonal incidence of tularemia coincides with the relaxation of the game laws protecting wild rabbits. The skinning, dressing or otherwise handling of rabbits has accounted for approximately 98 per cent of the infections in this state.

The writer estimates that approximately 500 cases of this disease have occurred in man in Kentucky during the past two years.

The long convalescence with its attending disability and economic loss, makes this *preventable* disease one of prime importance to the public.

The most important factor in the diagnosis of tularemia is to have the disease in mind. The history of contact with wild rabbits followed in two or three days by the development of an indolent ulcer, usually at the site of injury, produced by a sharp fragment of rabbit bone or knife and accompanied by enlargement of the regional lymph glands and onset of symptoms characteristic of influenza, present presumptive evidence of an infection with bacterium tularense.

In the glandular type of the disease there is no visible primary lesion, but there is enlargement of the regional lymph glands.

In the typhoid type there is no primary lesion and there is no adenopathy. Fever is the outstanding symptom and it closely simulates typhoid fever.

The simplest and best method for obtaining confirmation of the clinical diagnosis is

to collect 4 or 5 cc. of the patient's blood, exactly as one collects it for the Wassermann test. Either the serum or the whole blood may be sent to any laboratory which has on hand the necessary *Bacterium Tularensis* antigen for agglutination reactions. The dry drop slide method is not reliable. The writer has observed several negative reactions from this method whereas the serum agglutinated in high titre. This test is highly specific. The agglutinins appear sometime during the second week of the illness. It is, therefore, useless to collect the blood during the first week or ten days. The titre reaches its maximum (1:1280 to 1:2560) from the fourth to the seventh week, followed by a gradual decline until, at the end of the first year, the average titre is about 1:140. The final agglutinating level to which most cases of long duration seem to come is 1:80 or 1:40. Experience of all investigators is in accord, namely, that agglutinins have never entirely disappeared from any case, that subsequent exposure to infection does not tend to elevate a tularensis titre acquired by the original attack, and that one attack of the disease confers permanent immunity.

A second confirmatory method is to isolate *Bacterium tularensis* from guinea-pigs inoculated with the blood of the patient or with material taken as early as the first week from the primary lesion or from the enlarged lymph nodes.

Cover glass preparations made directly from the exudate evacuated at the time for surgical drainage are of no use in determining the identity of the organism. *Bacterium tularensis* is a small, non-motile, gram-negative organism which exhibits marked pleomorphism in its growth on special cystine-containing media. The organism will not grow on ordinary media.

As yet, no specific treatment has been developed. Treatment is essentially symptomatic. It is useless to incise the primary lesion, and it is unwise to excise, or even incise, the enlarged regional lymph nodes until definite suppuration is present. There is no evidence that any intravenous therapy (iodides, mercurochrome and other dyes) has altered the course of the disease in any way.

The most important phase of the treatment is prophylaxis, and this is best accomplished by education of the market men and the laity in general as to the dangers of the infection and the manner in which it is acquired, by urging thorough cooking to destroy the infective agent and by the warning that all individuals who handle wild rabbits should wear rubber gloves.

DISCUSSION.

E. B. Bradley, Lexington: I am going to add

only a word or two because we are anxious to hear the next paper by Dr. Dunham. Tularemia was the hit of the meeting of the A. M. A. in Minneapolis this year. Dr. Francis read a paper there and his exhibit and that of Dr. Simpson received both the gold medals. This is an all-American disease. So far as we know it has been discovered in only one other country and that is Japan.

On account of the virulence of the organisms of this disease, the bacteriology has not been worked up as completely as in some others, so up until this time no specific treatment of any kind, either antibacterial or antitoxic has been developed.

During the rabbit season this year in Kentucky there will occur probably something like two to three thousand cases of this disease as about six hundred were reported last year. It is due to the activity of men like Dr. Kavanaugh in bringing tularemia to the attention of physicians that the disease is now being recognized. As he stated, tularemia has been present in Kentucky for twenty years, and yet it has been only two or three years, and yet it has been only ported from this state. Dr. Kavanaugh tells me that he hopes next year to treat some cases with convalescent serum. A disease that gives agglutination tests for so many years after its occurrence should produce certain antibodies which might be either antitoxic or antibacterial. I believe that within the next year or two we will see the development of some specific treatment for this disease.

It is necessary to think of tularemia in order to diagnose it. The patients with ulcerative lesions usually go to surgeons who think they are dealing with the ordinary pus infection, or, the condition may be taken for a primary sore. With the ulcerated sore, large glands and fever and an occasional skin eruption, the resemblance to syphilis is very close.

The laboratory of the State Board of Health is subjecting every blood that is sent in for agglutination for typhoid fever to the tularemia agglutination also. In this way quite a few cases of tularemia have been picked up where the diagnosis was unsuspected.

I am sure the Society is grateful to Dr. Kavanaugh for presenting this paper.

J. G. Bosley, Richmond: On December 2, of 1926, I was called out to see Billy and he had on his thumb what I took to be an ordinary abscess. It was not filled with pus sufficiently to lance it, and I directed the mother (he was complaining of quite a bit of pain) to apply heat. I was called back the following day, and not knowing what I was dealing with, I made a very free opening and dressed it as I would an abscess.

That happened to be on Friday. Saturday she called me back and said, "Billy is no better, he

is still suffering intensely." I went back to see Billy and the skin had retracted and there stood up like a head of cauliflower, for a better term I will say just globules of pus. There was not any pus running. I would take it off with a piece of cotton and it would come back immediately.

I have not seen anything like it and I had no idea what had happened. I supposed that I had caused this trouble.

On Monday following, the mother came to my office before I had an opportunity to get there, and she said, "I found out what is the trouble with Billy. He has rabbit disease."

I said, "What? Do you know another name?"

She said, "There is another name for it."

I said, "I never heard of rabbit disease."

She said, "Here is a clipping from a Lexington paper." It was by Dr. Allen.

Needless to say, I got quite busy and wrote to Dr. Allen, who is the all-time health officer of Fayette County. I wrote him that day and asked him to give me the symptomatology. I gave the case I had as nearly as I could. And I asked for the treatment.

In reply to my letter Dr. Kavanaugh called me by phone and said, "Will you permit me to see your patient?"

I said, "Permit you? I will gladly welcome your coming."

He came over the following day. He said, "You have tularemia, unquestionably." He took pictures, and they were thrown on the screen this afternoon.

I found no treatment I had given had benefited it. I put a little notice in the paper, as Dr. Allen had done, warning the people about care in the preparation of rabbits. One of the local physicians said to me, "Bosley, what is that you are pulling off? Where did you get that information?"

When we went over to the Medical Society I spoke of it again. One of them said, "I want you to go with me tomorrow. I have something like it."

We had five cases that year. That was in the winter of '26-'27. In the winter of '27-'28 there were in Madison County some twelve to fourteen cases. This little Billy was the most pronounced. This was on the right hand and I thought it was going to develop an abscess in the axilla, but rather than forming in the axilla, where there was some enlargement, the abscess formed about midway between the shoulder and the elbow. I was quite well aware of the fact that it was ready to open. I have never seen such a flow of thin watery pus. About the time that healed there was another abscess that came (all on the right side) near the elbow, not nearly so large as the first. I opened that and it drained pretty freely. About the time that healed, as Dr. Kavanaugh tells you they heal very

readily, there was another abscess just above the right knee.

A Negro woman that I had under my care, in preparing a rabbit was stung on the thumb of the left hand. She had an abscess forming at the angle of the jaw on the left side. Then I had a Negro woman who had an infection of the index finger of the left hand and the little finger of the right hand. She was working in a restaurant preparing these rabbits. Fortunately she did not form abscesses on either side of the body. She had just a nodule that came on the left hand that was not excised.

R. H. Cowley, Berea: I have seen several of these cases and in cooperation with Dr. Kavanaugh next fall we will try to combat these cases with convalescent serum. I think I know where I can get the serum to try on the cases of tularemia.

R. W. Wood, Cynthiana: When I saw my first case I took it to the Lexington clinics and fortunately, Dr. Kavanaugh said, "Send it back down here. I am going to test it again." It came back tularemia. As to the discussion of how long the fever lasted (it was in '26, I believe), the patient had it for a while up and down, just like a remittent fever, and at last I wanted to know how long she had that fever. She said just as long as she had the thermometer. She really has had better health last year than she ever had before. It was tested lately and test shows positive. She has no fever and she is doing better.

I find that the cases that I have of the typhoid form often do just as well out of bed as they do in, not because I put them outside, but you can't control patients in the country. When they come to my office, I treat them the best I can, as I would any other remittent fever.

Whether I am right or wrong, we might think of this at least: After two or three weeks I have used the iron and arsenic ampules intravenously and I have found most marvelous results in building up and gaining flesh, gaining strength, and they apparently are well. I said apparently. In regard to the case that the patient had fourteen years, I saw the case a year or two ago, and Dr. Kavanaugh made the test for me. It was such a clear one about twelve years after, that from the history I was sure of infection fourteen years ago. I have had two cases of which I am sure, in 1915, out in the country. The reason I have let a great many of them get away from me (I have seen seventeen) is because they are tenants who live here this year and somewhere else next year. I would suggest that in every medical society this fall, as we did last year, ask that every member report every case to the society. Harrison County got a pretty bad name for tularemia owing to the four cases at Cincinnati from shipment of rabbits from Cynthiana. I reported to the medical society and asked them to look up all suspi-

cious cases, therefore, we showed more cases in Harrison County than most places. I believe if those physicians who are sure of it and will bring cases into the medical society and let people look at it a little, it will help us.

I want to insist, as Dr. Kavanaugh has done (I have opened some of them and made a mistake), to never open abscesses until they have gotten very soft. I don't know whether I am right or wrong, but I am recommending the use of arsenic. The use of red oxide of mercury ointment seems to make abscesses more rapidly come to a softening.

Virgil Simpson, Louisville: As we think back over our experiences of the past several years and are having agglutination tests made on those we are now holding as suspects, many have proven to be undiagnosed cases of tularemia. You have all had them. You have treated them as septic infections from a surgical standpoint, and yet many of them were tularemia.

It is interesting that most of the initial lesions, as they are called, are single lesions, but we have had several cases in which there were multiple infections, several in which there were two infections on one hand or one on one hand and one on the other.

Tularemia is also interesting from the viewpoint that the condition has presented itself in such distinct clinical form. I do not like the nomenclature that has been adopted in grouping them into three classes, namely the ulceroglandular type, the typhoid type and the ophthalmoglandular type, but preferably I believe we should think of the whole thing as tularemia. If one wants to make a classification, call those cases with an ulcer and with gland involvement, **tularemia with primary lesion and gland involvement**, and call all the other cases **tularemia without recognizable initial lesion and without gland involvement**. It makes no difference whether the initial lesion is in the conjunctiva or on the skin, it is an initial lesion just the same. Tularemia is interesting from another standpoint in that the absolute diagnosis rests on two things only, on the agglutination test, which is definite, and which, as has been said, lasts a long, long time, and it rests, in the second place, on the fact that you can grow cultures from the human blood, as it has been done.

It is interesting in the next place, in that the disease is, as far as we know now, with the exception of one single case that the essayist has referred to, which is considered doubtful, not directly transmitted from man to man. It is interesting from another standpoint in that it is singularly a fatal disease among the lower animals, such as have been mentioned, and that it is accompanied with a relatively low mortality, considering the mortality in animals, when it attacks man.

We have had one case that was of peculiar interest to us in that it manifested a pericarditis

with effusion, and aspiration was done, the patient recovering.

It is interesting from the final standpoint in its chronicity. Chronicity marks the development of the initial lesion, it marks the activity of the process in the glands themselves, and it marks the progress of that type of tularemia which is referred to as the typhoid type. It can be diagnosed clinically from the typhoid type in the end, though it ought to be done earlier with agglutination tests, by the fact that there are no rose colored spots, by the fact that there are no such complications as we usually have in typhoid fever such as intestinal hemorrhages, and by the fact that the recovery takes place long after typhoid recovery usually takes place, unaccompanied by the singularly increased appetite and the rapid increase in weight which often occurs in the convalescence from typhoid fever.

A satisfactory explanation of the way of entrance of the germ in the non-ulceration cases has not been offered. It is interesting to note that cystin is required in the culture media for the organisms growth and that cystin is present in the skin. But this does not explain why a papule does not form when the germ passes through unbroken skin, but does colonize and form an ulcer on a broken skin surface.

B. K. Menefee, Covington: Hearing this discussion has prompted me to report a case I had twenty years ago in which I did not make a diagnosis until last winter. You cannot call that a snap diagnosis.

I was called about ten o'clock one evening to see a very delicate young married woman who gave a history, as follows: She was preparing a rabbit for the supper, and one of the bones punctured her left forearm. When I saw the girl about ten o'clock at night, she had a temperature, as I remember, of about 104, rapid pulse, redness and swelling and all the symptoms that you see in an ordinary septic infection. The symptoms were so alarming (I was not the regular family physician) that I called the family doctor. He came to see her, with me, and encouraged me to treat her symptomatically until we could determine what was going to happen.

The temperature lasted, as well as I remember, for about four days, a pretty high temperature, which gradually subsided, and then she began to have glandular involvement. Later on these glands became soft, I hesitated about opening them until they were real soft, and did open several, promising the girl that within a short time she would be all right. Much to my chagrin she didn't get all right, she went on and on, and I had the hardest time of my life holding that patient. Her family doctor insisted that I keep the case. I treated her, I think, over a period of six or eight weeks, and finally had to surrender. She came to the conclusion that I didn't know much about what I was doing, and I think she was right.

The doctor, Dr. Jones, my colleague, took charge of the case, and he treated her for some weeks, I don't remember how long. She finally developed an immense abscess in the pectoral muscles, Dr. C. A. Langdale of Cincinnati was called and opened that, and it was drained, and it was months before she was well. She is still living and I will be very glad to furnish the doctor with a specimen of the blood to see if she still has evidences of that trouble.

I am happy to say that at the Cincinnati Academy of Medicine several months ago I heard a paper on this subject and congratulated the doctor as he helped me out in the diagnosis of my case.

Paul Turner, Louisville: I had expected to be silent during this discussion, but apparently it was known that I did some work years ago in the early days of the investigation of tularemia. I have seen but one case in the last several years, and that was one case sent to the sanatorium as a tuberculous individual, which was finally diagnosed as tularemia.

At the time Francis was investigating in California, we were carrying on in the state of Washington some similar work. We had noted certain cases that we could not diagnose as Rocky Mountain tick fever, but which had certain features in common with this disease. We also noticed that the rabbits at that time of year were very much less noticed than they were the year before. We wondered why we didn't have all those jacks overrunning everything in the prairie country the way they usually did, so we felt that there was something that was killing them.

We knew, of course, that the wood tick was prevalent among the rabbits, so the laboratory began to collect wood ticks and see if we couldn't find some organism that would be the cause of this rabbit epidemic. We never did come to the absolute proof that the tick was causing these cases of tularemia, but at the San Francisco meeting of the American Medical Association, I reported our work and said that I felt that the tick was certainly the host of the bacillus tularensis. That later of course was proven.

Peroral Immunization Against Diphtheria.—

Immunization by peroral administration of diphtheria toxin-antitoxin, preceded by sodium benzoate according to Reiter's method, was tried with twelve children who reacted positively to the Schick test. Nine remained positive. In one case there was a paradoxical reaction at the point of control. Only two cases were Schick negative. These last three children, when given the Schick test a year later, showed a questionable reaction; the patient with the paradoxical reaction reacted as before. Bischoff concludes that peroral immunization does not bring the desired result.

ACRODYNIA IN CHILD AGED FOUR YEARS.*

By PHILIP F. BARBOUR, M. D., Louisville.

I am reporting the following case of acrodynia because of the rarity of the condition and because it offers some suggestion of the cause of the disease.

Acrodynia is a disease which is accompanied by a peculiar redness of the extremities, particularly the palms of the hands and soles of the feet with a non-pitting edema and sometimes very pronounced nervous symptoms. The name would indicate a painful lesion of the extremities but judging from the case herein reported acrodynia is not associated with severe pain. Lucas in his recent text books on disease of children says that only fifty authentic cases have been reported.

The patient was a male child, aged four years. In the majority of juvenile cases the children were less than three years old. The patient was referred to me by the family physician who thought he was suffering from pellagra. The family history was entirely negative. The child was normal at birth and weighed ten pounds. He had the ordinary digestive disturbances incident to early life, otherwise had been healthy until the present illness, which began early in 1927.

The first symptoms noted were pain in the stomach, nervousness and irritability. Examination disclosed marked redness, swelling and a shiny eruption involving the palms of the hands and soles of the feet. The lesions extended slightly above the ankles, over the palms of the hands and around the finger nails, the dorsal surfaces of the hands remaining free.

During the entire time the child was under observation there was an intense itching of the palms and soles, and the peculiar nervous symptoms presented were characteristic of acrodynia. Although the child was four years old he paid no attention to anything that was said or done. He was very nervous, restless and irritable. When the father attempted to hold him in his arms, he would reach over and bite his father on the neck or shoulder and acted like a crazy person. He refused to walk and would beat his head against the floor. He was utterly irrational when I first saw him. I thought the child was possibly an idiot.

The diagnosis of acrodynia was based mainly on the peculiar redness and discoloration of the extremities which were edematous but did not pit on pressure. These manifestations are characteristic. Around the nails and also on the palms of the hands was a pustular

*Read before the Louisville Medico-Chirurgical Society.

eruption. The nails looked as if they might be lost from the ulceration. He did not present the marked ulceration of the gums which has been observed in most recorded cases.

One significant item in the history was that the mother had trouble in getting the child to eat during all his life. He seemed to have little appetite, he would not touch an egg, and his diet consisted principally of milk, cereals and buttermilk. He had never eaten a green vegetable.

His blood count showed erythrocytes 6,800,000, hemoglobin 80 per cent, leucocytes 17,800. Differential count: polymorphonuclears 83, lymphocytes 6, basophils 10, transitionals 1.

There are three theories as to the origin of acrodynia. First, that it is an infectious disease. Second, the generally accepted theory that it is one of the types of avitaminosis. Third, that it is one of those peculiar anaphylactic reactions; but very few accept the latter view. In favor of the lack of vitamins was the fact that this boy had never eaten any green vegetables, and this led me to believe the cause of the trouble was avitaminosis.

As the erythrocyte count was very high and the leucocyte count was over 17,000 the child was given nucleinic acid. Two or three weeks afterward when brought to my office his blood count showed: erythrocytes 4,200,000, hemoglobin 90 per cent, leucocytes 5,000. He still presented the symptoms already described but was decidedly improved.

In the treatment this child was fed all the vitamin-containing foods known to me. Cod liver oil, green vegetables, fruits, orange juice, etc., and in the course of six months he was practically cured. The usual time required for these patients to get well is about nine months.

A curious feature about the case is this, that if acrodynia is due to avitaminosis why does it respond so slowly to treatment? It would appear that if acrodynia were due to this cause, under proper feeding for two weeks or a month the child should be well; but these cases persist for a long time. Nine months is given by Lucas as the time from beginning of treatment until complete recovery.

In the case reported the child recovered in about six months under cod liver oil, the vitamin-containing foods, iron and arsenic.

DISCUSSION.

John E. Hays: The case reported by Dr. Barbour is undoubtedly one of acrodynia. The symptoms are so characteristic as to make the diagnosis positive. The etiology of this condition is unknown. It has been found in these cases, especially in older people, that the metabolism is at fault, and such patients are often

benefited by the administration of thyroid. My own impression is that the majority of these cases are due to toxemia.

Philip F. Barbour (in closing): The marked nervous symptoms in these cases is a very interesting feature. No one has ever given a rational explanation of why they occur. When this child bit his father he acted wholly irrationally.

I recall having encountered one other case of this nature several years ago. In that case I did not make the diagnosis of acrodynia but treated the child from the standpoint of general nutrition, regulation of diet, etc. and recovery followed.

One is apt to be misled by the intense itching that occurs in most of these cases. If the disease is due to anaphylactic reaction, the slow response to treatment is difficult to understand. Even in pellagra it takes a long time before the lesions disappear. In acrodynia also response is slow and treatment is necessary over a long period of time.

I did not give this child thyroid nor do I think it was indicated.

NEWS ITEM

MEDICAL AND PHARMACEUTICAL CO-OPERATION

Perhaps one of the outstanding reasons for the progress in the scientific development of new products has been the spirit of cooperation which has existed between the medical profession and the pharmaceutical industry.

By this close cooperation medical science has contributed to pharmaceutical progress and the manufacturing pharmacists of the country in turn have made a definite contribution toward the development of new medicinal products.

On Wednesday, December 5, the officials and members of the medical, pharmaceutical and allied professions of Lafayette, Indiana were addressed by Dr. Charles E. Vanderkleed, Chairman of the Contact Committee, of the American Pharmaceutical Manufacturers' Association.

The subject of Dr. Vanderkleed's address was "Improvement in the Quality of American Drug Products due to Cooperation in the Industry." It is interesting to see the representatives of the several allied professions making arrangements for a periodical study of mutual interests of professional nature with a view to increasing mutual usefulness.

It is only through medical and pharmaceutical co-operation that the greatest advances can be made in conquering disease and improving the health of the American people.

—News item from American Pharmaceutical Manufacturers' Association.

WOMAN'S AUXILIARY NOTES

The following officers have been elected to serve the Whitley County Auxiliary for this year:

President—Mrs. L. L. Terrell.
1st. Vice-president—Mrs. J. H. Parker.
2nd. Vice-president—Mrs. F. S. Smith.
3rd. Vice-president—Mrs. Nannie Siler.
4th. Vice-president—Mrs. A. C. Foster.
Secretary—Mrs. B. J. Edwards.
Treasurer—Mrs. Lora Bryant.

The Whitley County Chairmanship for Hygeia Circulation was given Mrs. A. C. Foster. Mrs. M. W. Steele, Corbin, is now serving as State Hygeia Chairman

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Garrard County Auxiliary Contributes to State Treasury

The Woman's Auxiliary to the Garrard County Medical Society sent a check for \$5.50 as a gift to the State Auxiliary in an endeavor to help replenish the treasury. This is the first contribution received in the drive toward this end.

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Perry County Auxiliary Contributes to State Treasury

The Woman's Auxiliary to the Perry County Medical Society sent a check for \$15.00 as a gift to the State Auxiliary.

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AT THE SOUTHERN

At Asheville, North Carolina, in the "Land of the Sky", the fifth annual meeting of the Woman's Auxiliary to the Southern Medical Association was held, November 12-14, 1928.

The attendance was the largest in its history, members coming from all of the sixteen states. Among those present from Kentucky were two officers of the Southern organization, Mrs. A. T. McCormack, Louisville, the President, and Mrs. J. W. Sams, Crestwood, the Corresponding Secretary; also, Mrs. Wm. M. Martin, Past President, and Mrs. W. G. Salisbury, Treasurer of the Woman's Auxiliary to the Kentucky State Medical Association and the following:

Mrs. Wm. T. Briggs, Lexington.
Mrs. R. Julian Estill, Lexington.
Mrs. J. P. Warren, Lexington.
Mrs. Charles A. Vance, Lexington.
Mrs. J. W. Acton, Glasgow.
Mrs. John H. Blackburn, Bowling Green.
Mrs. Robt Cowley, Berea.
Mrs. A. P. Dowden, Eminence
Mrs. C. M. Gower, Trenton.
Mrs. D. M. Griffith, Owensboro.
Mrs. J. C. Hoover, Owensboro.
Mrs. J. M. Salmon, Ashland.
Mrs. B. K. Menifee, Covington.
Mrs. C. A. Menifee, Covington.
Mrs. J. A. Orr, Pris.
Mrs. W. L. Strumbo, Smalley.

Mrs. Wm. S. Napper, Lebanon Junction.
Mrs. H. K. Buttermore, Harlan.
Mrs. P. H. Stewart, Paducah.
Mrs. C. E. Kidd, Paducah.
Mrs. B. J. Edwards, Corbin.
Mrs. J. H. Parker, Corbin.
Mrs. M. Pennington, Mt. Vernon.
Mrs. Wm. E. Fallis, Louisville.
Mrs. H. J. Farbach, Louisville.
Mrs. C. G. Forsee, Louisville.
Mrs. J. P. Ferguson, Louisville.
Mrs. Wm. E. Gardner, Louisville.
Mrs. M. J. Henry, Louisville.
Mrs. W. Hamilton Long, Louisville.
Mrs. J. S. Lutz, Louisville.
Mrs. Adolph O. Pfingst, Louisville.
Mrs. J. B. Shacklette, Louisville.
Mrs. Kenneth Gray, Louisville.
Mrs. W. T. McConnell, Louisville.
Miss Grace Stroud, Louisville.
Mrs. T. Cook Smith, Louisville.

The General Session was held in the beautiful Roof Lounge of the Battery Park Hotel, Tuesday morning, November 13, with the President in the chair. The program, interesting and varied, was carried through on schedule, each officer and delegate responding promptly. The state reports were varied and interesting. Outstanding perhaps, was the report of the "Marion Sims Memorial," erected by the Auxiliary in South Carolina.

Dr. Wm. R. Bathurst, of Little Rock, President of the Southern Medical Association, brought cordial greetings and encouragement for greater growth and progress.

Mrs. Allen H. Bunce of Atlanta, President of the Woman's Auxiliary to the American Medical Association, our National Organization, delighted the members with her presence and stimulating message.

"Jane Todd Crawford—Pioneer Heroine of Surgery" was the subject of the President's address and will be published in full in the next "Bulletin of Woman's Auxiliary to the Southern Medical Association."

Following the installation of the new President, Mrs. C. W. Garrison, Little Rock, Mrs. McCormack announced that a message from Mrs. Garrison's State President and all the Arkansas members had been brought over the hills by a fairy. Then in came Mrs. Wm. L. Dunn of Asheville with a magnificent basket of lavender chrysanthemums which she graciously presented Mrs. Garrison as she feelingly read the beautiful message from Mrs. T. G. Porter.

The gavel, presented last March by Mrs. S. A. Collom of Texarkana, Texas, was first used at the preceding Executive Board meeting, November 12. It is a beautiful piece of workmanship and was made from a walnut tree which grew in two states, in Mrs. Collom's door yard, on the line between Texas and Arkansas. A

narrow band of silver, suitably engraved decorated the handle.

The Bulletin, edited by Mrs. C. W. Garrison and printed this year for the first time, made its debut at this meeting. It is a neat, attractive booklet and contains valuable information. A copy has been sent each state president and each county president. Additional ones may be secured by writing Mrs. C. W. Garrison, 317 Ridgeway, Little Rock, Arkansas.

At the suggestion of Mrs. Seale Harris of Birmingham, the state presidents were requested to submit an original song for the use of the Auxiliary in Asheville. Kentucky was the only state that complied with this request. Appended is a copy of the Kentucky contribution which all the members sang with expression and feeling under the leadership of Mrs. W. H. Nardin of Anderson, South Carolina, with Mrs. W. G. Salisbury of Louisville, Kentucky at the piano.

Early in the year, Mrs. J. W. Sams of Crestwood, acting as Chairman of Historical Collections, wrote each state president asking that she send her State Auxiliary Scrap Book to the fifth annual meeting for an exhibit. Four scrap books reached Asheville. They were from Arkansas, Kentucky, Virginia, and, the original of the auxiliary scrap books, that of the Southern, started immediately following the organization of the Auxiliary in New Orleans, November 1924. The prize for the best and most complete scrap book, a beautiful blue leather folding clock for use at auxiliary meetings, was awarded to Kentucky.

The social affairs arranged by the ladies of Asheville and the members of the Buncombe County Medical Society were delightful and planned with consideration for the business and official meetings of the Auxiliary. With perfect Indian Summer weather, the glorious hills of Asheville were at their best and thrilled the visitors with each new vista of tapestried color and jagged skyline, as they spiralled the mountains in the whizzing motor cars of their hostesses. Mrs. J. W. Huston was the local general chairman and Mrs. R. A. White was chairman for the auxiliary activities in Asheville.

Charming luncheons, teas, dinners, breakfasts, even, were enjoyed each day. The organ recital by Mrs. Arnold Dann at Grove Park Inn was a musical program greatly appreciated. All enjoyed inspecting the unique architecture and tasteful decorations of the Inn, following the recital.

The President's Reception and Ball held at Kenilworth Inn on the night of November 14 was a brilliant affair. Beautifully gowned women, escorted by men in formal attire strolled through the lobbies and danced in the brilliantly lighted ballroom. Southern hospitality, Southern beauties and Southern gentlemen were at the height

of their renowned glory.

The officers elected to serve this year are:

President—Mrs. C. W. Garrison, Little Rock, Arkansas.

President-elect—Mrs. J. N. Brawner, Atlanta, Georgia

1st. Vice-President—Mrs. W. H. Narden, Anderson, South Carolina

2nd. Vice-President—Mrs. A. Byron Holmes, Fairmont, North Carolina.

Recording Secretary—Mrs. J. W. Sams, Crestwood, Kentucky.

Corresponding Secretary—Mrs. B. A. Rhinehart, Little Rock, Arkansas.

Treasurer—Mrs. Edw. D. Mitchell, Memphis, Tennessee.

Parliamentarian—Mrs. Southgate Leigh, Norfolk, Virginia.

The next annual meeting will be held in Miami, Florida, November, 1929.

AUXILIARY SONG

ONWARD S. M. A.

(Tune Onward Christian Soldiers)

Onward members of *S. M. A.
Though our number's small,
Let us strive to rally
At the Southern's Call;
Friendship is our watchword;
Auxiliary work our aim;
May we make our *S. M. A.
Add to Southern fame.

Chorus

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*Emphasize S.

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BOOK REVIEWS

THE SURGICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month.) Volume 8, number 3. (Chicago Number—June 1928) 219 pages with 49 illustration. Per Clinic year (February 1928 to December 1928). Paper \$12.00; Cloth, \$16.00. W. B. Saunders Company, Philadelphia and London.

The Surgical Clinics of North America bring you clinical instruction—postgraduate work with America's leading surgeons as instructors. In this new series the subscriber gets the clinical work of leading surgeons, operating and teaching at the large hospitals of America's principal surgical centers—Philadelphia, New York, Chicago, Boston, The Mayo Clinic, San Francisco, St. Louis, the South, and other surgical centers. The Clinics give you the experience of the country's great teacher surgeons, their methods and technic.

SOLLMANN & HANZLIK'S EXPERIMENTAL PHARMACOLOGY. Octavo of 321 pages, illustrated. By Torald Sollmann, M. D., Professor of Pharmacology and Materia Medica at Western Reserve University, Cleveland; and Paul J. Hanzlik, M. D., Professor of Pharmacology at Stanford University, San Francisco. Cloth, \$4.25 net.

This new text-book is simple in arrangement, gives definite instructions for experiments and demonstrations and full explanatory discussions. Emphasis is placed on Demonstrations because of the accuracy thus assured, the economy and flexibility of the time element, the easier introduction of new material, and a smaller consumption of animals.

Part I is devoted to Chemical Pharmacology, giving demonstrations, experiments, and practical questions. Part II is devoted to Experimental Pharmacodynamics. Here the demonstrations and experiments are grouped by the various organs or functions, to articulate with the student's experience in physiology and pathology.

ESSENTIALS OF PRESCRIPTION WRITING. By Cary Eggleston, M. D., Assistant Professor of Clinical Medicine, Cornell University, Medical School.

A most worthwhile little book for every medical man to read and study. True to its title, it deals with the essentials of this phase of medicine, stressing the importance of the knowledge and use of the metric system in the writing of prescriptions.

Fourth edition, Revised. W. B. Saunders

Company, Publishers. Philadelphia and London. Cloth, \$1.50 net.

PREVENTIVE MEDICINE. By Mark F. Boyd, M. D., C. P. H., Member of Regular Field Staff, International Health Division of Rockefeller Foundation; formerly Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas.

Although this is not a new field of medicine, it is one of paramount importance. The conscientious student and practitioner of medicine of today should be well versed in all phases of this most important subject. The author has given us, in this book, a very fine work, covering well the entire field.

Third edition, Revised. W. B. Saunders Company, Publishers. Philadelphia and London. Cloth, \$4.50 net.

PRACTICAL SURGERY OF THE ABDOMEN. In Two Volumes. By George H. Juilly, M. D., Chief Surgeon to the French Hospital, San Francisco, California.

The author has fulfilled to a high degree his aims in these two volumes. First, by concise notes and step-by-step sketches, he describes the essential structures upon which the surgeon will work in performing a certain operation. His second aim is the importance of correct diagnosis and with that in mind gives the differential diagnosis of each condition.

It is a very practical and instructive work and merits the consideration of every student and practitioner of medicine.

F. A. Davis Company, Publishers. Philadelphia, Pa. Two Volumes, \$16.00 net.

PRINCIPLES AND PRACTICE OF OBSTETRICS. By Joseph B. DeLee, M. D., Professor of Obstetrics, Northwestern University Medical School. Fifth Edition, Thoroughly Revised. Large octavo of 1140 pages, with 1128 illustrations, 201 in colors. Philadelphia and London: W. B. Saunders Company, 1928. Cloth \$12.00 net.

You will find Dr. DeLee's book is not only superb from the physical standpoint, but also as regards the practical standpoint. Dr. DeLee's aim having been to produce a book that would meet fully every need of the practitioner as well as the obstetrician. For this reason diagnosis is featured. You get, also, the very latest advances in treatment, and you can rest assured every method of treatment, every step in operative technic is just right. Descriptive legends under the \$15,000 worth of illustrations are unusually full.

Kentucky Medical Journal

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Incorporated

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COUNTY SOCIETY REPORTS

Jefferson County Society Report

WHEREAS, In the death of Dr. Bernard J. O'Connor, the Jefferson County Medical Society suffers the loss of a worthy and highly respected member, who for many years has taken an active part in promoting the welfare of the Society, and has ever shown himself interested in the good of the individual members; and

WHEREAS, His ethical practice, his self-sacrificing devotion to duty, his loyalty and cheerful good will to all has left its impress indelibly engraved in the memory of all who knew him; therefore be it

RESOLVED: That the Jefferson County Medical Society feels deeply its loss, and that it desires to express its sincere sympathy to those nearest and dearest to him.

RESOLVED: That these resolutions be spread upon the minutes of this Society, and a copy thereof be sent to the bereaved family, and to the Kentucky State Medical Journal.

CHAS. E. GAUPIN,
RICHARD R. ELMORE,
BERNARD ASMAN,
Chairman.

Committee Jefferson County Medical Society.

Friendship's Tribute.

The city of Louisville, the State of Kentucky and the medical profession of this country have just recently suffered a great loss by the death of Dr. F. W. Fleischaker. I think it was Stevenson who said, "There are men and classes of men who stand above the common herd, the soldier, the sailor and the shepherd not infrequently, the artist rarely, the physician almost as a rule." I think that this is true.

Medical men, even outstanding medical men, as a rule receive very little public recognition or gratitude, while on the other hand a local politician of even minor rank has his name heralded abroad and is constantly before the public. I have often wondered why the discrimination. The real worth-while doctor of course shuns publicity and advertising methods. He goes about his work quietly, modestly and unassumingly; yet he spends his life working for the relief of human suffering and the promotion of human welfare. A great part of his work is always charity work, for which he receives no remuneration, yet he does it cheerfully and willingly. The night is never too cold, dreary or snowy, if his people need him. The physician is in constant peril of contracting some of the dangerous diseases which he is called upon to treat, yet he never refuses to go. He never even hesitates. He knows no fear. The typical doctor is an outstanding member of his community, loved and respected by all.

Dr. Frank W. Fleischaker was a type of all

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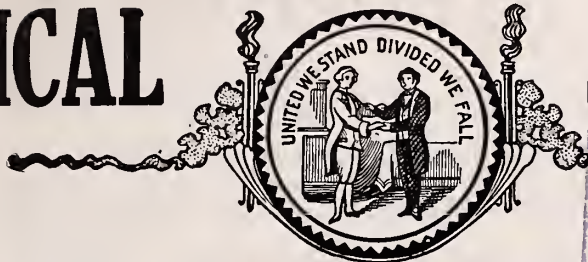
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KENTUCKY MEDICAL JOURNAL



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Wayne Babcock's Surgery

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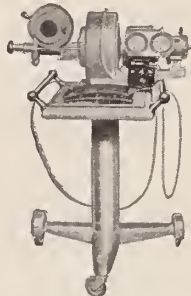
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BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

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BOWLING GREEN, KY., FEBRUARY 1929

No. 2

EDITORIAL

A RADIO HOUR

Through the courtesy of the Courier-Journal and the Louisville Times, the facilities of their national broadcasting station W-H-A-S have been extended to the State Board of Health for the purpose of broadcasting public health education. The hour assigned, Tuesday afternoons at five o'clock, has been so arranged as to talk to the household, as it begins its evening assemblages.

The people of Kentucky have entrusted their public health affairs to the control of the medical profession. Its new responsibility will be accepted by the State Board of Health with a sense of fidelity to the profession and its public interest. It must always be realized that the practicing physician has the most potent influence in the advancement of public health. The doctors of the various bureaus of the Board will explain their work and organizations so that everybody may understand them.

The Journal suggests to the readers that they tell their patients about this hour and urge them to tune in for these health conferences.

DOCTOR HORACE T. RIVERS

The recent death of Doctor Horace T. Rivers at Paducah, removes from Kentucky one of its most zealous and active surgeons. Since his graduation Doctor Rivers was present at every annual meeting of the Kentucky State Medical Association. For 29 years he was a member of the House of Delegates. Alert, attentive, loyal to all that is best in the profession, few men exerted more influence in the deliberation of this important body. For many years he was President of the McCracken County Board of Health and was responsible for much of its effective work.

The Journal joins his friends in expressing to Mrs. Rivers and to his family its profound love and sympathy in hers and its irreparable loss.

DOCTOR J. M. MATTHEWS

Few of its members have shed as much lustre on the medical profession of Kentucky as Doctor Joseph McDowell Matthews, who recently passed away in Los Angeles, where he has been living since his retirement from active practice.

Doctor Matthews was born and reared in Henry County and did a general practice there for a short time before moving to Louisville. Early in his career here his attention became focused upon the diseases of the rectum and he was the first physician to limit his practice to that region. Theretofore, this had been one of the neglected regions of the body. Few men have had the same facility for expression that characterized this master of the English language. His zeal in his work and his remarkable ability to express to the profession the results of his labors, soon brought him into great prominence. Combined with his other qualities he was a wonderful teacher. The brilliance of his attainments attracted to him a group of younger men who have continued his work with great benefit to the human race everywhere.

Doctor Matthews was a natural leader. Capable of prodigious exertion, he worked so easily and quietly that he always seemed to have an abundance of leisure for the consideration of the many problems in whose solution he took a prominent part. He was President of the State Board of Health during its most active developmental period. His administration as President of the Kentucky Medical Association marked one of its most successful years. He was unanimously elected to the Presidency of the American Medical Association, and, during the remainder of his active career was one of its most influential and constructive leaders.

Few Kentucky physicians have left so prominent a mark as this beloved man. His pupils and disciples, both here and in almost every city of the United States, are a living monument to his fine spirit of devotion to his high calling.

RABIES

Rabies is usually considered a disease to be dealt with only in the summer months. Contrary to this belief we are having in the laboratories of the State Board of Health an unusual number of dog heads from every section of the State, showing rabies, which leads us to believe that this disease is spreading very rapidly in every county in Kentucky.

If the County Medical Societies would cooperate with the County Health Officer and the citizens to explain the situation to their people that it is the stray, homeless, ill-fed dog that is causing the spread of this disease it would help eradicate it.

If a person is bitten by a dog, the wound should be cauterized immediately with fuming nitric acid and if there is any suspicious illness in the dog, Pasteur treatment should be started immediately; confine the dog until it dies, cut its head off and send it to the Laboratory.

We are recommending the Semple treatment which costs \$12.50 and requires only fourteen days for its administration.

It will take the combined efforts of the health officers, physicians and citizens to stamp out this disease.

SCIENTIFIC EDITORIAL

THE TEACHING OF OBSTETRICS

In his Presidential address before the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Dr. Palmer Findlay of Omaha, Neb., initiated a movement, endorsed by the society, for the equal recognition of General Surgery and Obstetrics in the curriculum of our medical schools.

At present the proportion of hours devoted to Surgery and Obstetrics is as 4 to 1. The students naturally prefer the glamour of the operating room to the tedious waiting of the obstetrical clinic. The question however must be viewed from the practical standpoint. It should be the purpose of our medical schools to equip their graduates so that they are prepared to face the first two years of their practice. It is self evident, that in the early stage of their career they will have little or no opportunity to take care of major surgical cases. Their work will practically be confined to Minor Surgery, General Medicine and Obstetrics. In Obstetrics they will at once be compelled to face any complications that may occur. Eclampsia, Placenta Previa, Forceps Version, etc., without in many instances being able to call in outside assistance. It stands to reason then, that in

order to lessen the fearful mortality and morbidity, that still occurs in this field and that has not been reduced in the last fifteen years, that doctors must be graduated properly equipped to meet these emergencies.

It is manifestly improper that this experience should be gained by conducting charity cases even with an instructor, in the unhygienic and improper surroundings that are always met in such work. There should be a sufficient number of beds available for maternity cases in our hospitals so that such teaching may be done and such experience may be gained in ideal and up-to-date surroundings. At present very few of the teaching hospitals have sufficient beds available for this purpose and it should be evident, that if this deficiency is not soon supplied, that the state and national governments will take control of the situation, a condition certainly not desirable. The matter of additional hours for the teaching of obstetrics may readily be obtained by curtailing the time devoted to the minor surgical specialties. The theoretical teaching of obstetrics in this country is said to be fairly up to the standard set by other nations and all the additional hours should be devoted to clinical work for it is only by direct contact, that experience in obstetrics can be gained.

Edward Speidel.

Anemia as Complication of Rickets.—Every case of rickets at the children's clinic in Basel, according to Baumann, was cured in from four to eight weeks by direct or indirect light treatment, an exclusive milk diet being maintained. All the specifically rachitic symptoms disappeared, but anemia remained. Baumann regards the anemia not as a rachitic symptom but as being due to lack of iron in the milk diet. It was found that this anemia could be prevented by adding a plentiful amount of vegetables and fruit to the diet or by giving metallic iron (*ferrum reductum*). He believes that the old prescription of Czerny should be followed—not more than ½ liter of milk a day with mixed food in abundance—but that this prescription is of more importance from the standpoint of the concomitant anemia than of that of the rickets. In premature infants as in other infants and young children, direct or indirect sunlight is an effective remedy for rickets, but, because of the impossibility of giving a sufficient amount of vegetables at an early enough age, energetic iron treatment is needed to combat the accompanying anemia. Fifty-four cases are reported in detail.

ORIGINAL ARTICLES

PRACTICAL SURGICAL CONSIDERATIONS OF HERNIA.*

By J. DUFFY HANCOCK, M. D., Louisville.

INTRODUCTION.

It is not our intention at this time to suggest any new operative procedures in regard to herniotomy; we believe that present-day technique is quite adequate for practically all cases. Neither do we desire to present any personal statistics in regard to mortality or end-results, since others have far more material to draw upon for such reports. What we want to do through the aid of the general practitioner is to try to teach the public that the radical operative cure of hernia is by far the most rational treatment in the majority of cases be it judged from the economic, social or mortality standpoint.

INCIDENCES.

While the term hernia may be correctly applied to the abnormal protrusion of any tissue from the cavity in which it is normally confined, it is generally limited to the protrusion of an abdominal viscus unless otherwise qualified. Lack of space compels us to limit further our consideration of the term to the inguinal variety which comprises 80 to 85% of all hernia, the vast majority of which are in the male.

Approximately 2% of male adults have inguinal hernia and perhaps as many more have enlarged external rings. How many of this number seek operative relief would be quite difficult to ascertain, certainly far fewer than should. We believe that any disease affecting 4% of the adult male population is deserving of much more publicity since such an effectual treatment is available.

HISTORICAL.

The recognition of hernia is referred to as early as 3000 B. C. and probably existed before then. Operative treatment was being practiced at the time of Christ. It would seem that surgical treatment known and practiced for so many hundreds of years would be accepted without question. Such, however, is not the case. In spite of the recent popularizing of the operation due to encouragement by compensation laws we believe that hardly a start has been made. A truss is anything but pleasant to wear. What then is the reason that prompts patients to use one rather than to submit to operation. We believe it is largely due to an improper understanding of the disease and its treatment.

The very word, "rupture," used quite gen-

erally by the laity (and too often by physicians also) is anything but quieting to the afflicted patient and is practically always a misnomer. Wouldn't it be much more reassuring to that patient if he were told that he had hernia which was explained to mean that the inner lining of the abdominal wall, with or without a loop of intestine following inside the pouch, was protruding through a defective opening in the abdominal musculature.

Another common misconception is the association of the disease with sexual disorders. This probably had its origin years ago when castration was part of the operative procedure and accordingly many of those having the disease were treated with scorn by their more fortunate brothers. Under this same consideration is the disfigurement of the external genitalia. Let us reassure our patient of the fact that the association is purely one of location and that no embarrassment need be felt on telling of the condition. Other misunderstood facts include doubt as to the permanency of cure, general and local condition after operation and the immediate post-operative discomfort. While it is of course not generally known by the laity we wonder if some of the attitude in the latter instance might not have been passed down by some who in by-gone days had been placed in plaster casts after operation.

The courses of procedure open to one who has a hernia are three: he may do nothing, he may try non-operative treatment or he may accept radical operative relief.

Spontaneous cure in an adult is such a rarity that it may be dismissed without consideration. Therefore, if one follows the first course he may expect a gradual, if slow, enlargement of the hernia which in time is likely to become irreducible and is always subject to strangulation.

Non-operative treatment can include various injections as well as the use of a truss or other mechanical support. Injection treatment deserves no discussion. It is to be absolutely condemned in all cases and fortunately is not popular at this time. Mechanical treatment includes the use of bandages, elastic supports and firm trusses of various designs. Bandages and elastic supports are so obviously unsatisfactory even to the layman that they receive little consideration.

The real choice then in relieving hernia lies between the use of trusses and submission to operative measures. The varieties of trusses for inguinal hernia are legion. The general principle followed is the same in all, that is the application of firm pressure by a pad over the entire inguinal canal after reduction of the hernial protrusion. This pressure

*Read before the Kentucky State Medical Association at Richmond, Sept. 10-13, 1928.

and counter pressure over the sacral region are accomplished by the use of an intervening steel spring and leather straps. Use of a truss in children under school age often results in a cure due to the delicacy of the tissues and should always be tried particularly if the child does not exercise complete control of urination and defecation; infection of operative wounds from all sources can be quite distressing.

The results achieved by the use of trusses in children often lead adults to hope for the same. We should make it clear to them that local conditions are quite different and such a cure of a well-developed hernia in an adult by the wearing of a truss is a great rarity. A truss can, however, afford varying degrees of relief against which the accompanying disadvantages must be considered. It must be worn "from now on," since there is generally some constriction of the neck of the sac rendering strangulation more likely than in one where the sac and its neck are of the same diameter. It should be applied before the patient arises from bed and not removed until he has retired. The truss and parts of the body with which it comes into contact must be kept scrupulously clean. Neglect to observe this may result in cellulitis of the abdominal wall. We were recently called upon to incise such an infected area and the patient was confined as long as would be required for a herniotomy but he still has his hernia. To facilitate cleanliness of the truss as well as their occasional repair it is advisable to have two trusses. This considered together with the replacements that will have to be made during the wearer's lifetime make the cost of the appliances of some little moment, certainly the equal of a ward bed and hospital bill for a herniotomy.

Other aspects of cost or financial loss can be suggested—inability to take advantage of more strenuous occupation with possible increase in wages, increased likelihood of enforced early retirement, etc.

Socially also, the truss wearer is handicapped. He is more tired in the evening than is his friend who has been cured by operation, he cannot engage in sports that are very strenuous, and he hesitates to travel much because he wants to be close to his friends if that ever possible calamity of strangulation occurs. This danger alone should be sufficient to persuade anyone to accept the interval operation.

Approximately 2% of inguinal herniæ and more of other varieties become strangulated and the operative mortality varies from 5 to 75% depending upon how soon attention is given, whether or not resection is necessary, etc. The morbidity is increased and the pa-

tient does not have the choice of time, place or surgeon. Frequently too a secondary operation is necessary.

What, then, are the advantages of a truss. They are all temporary. There is no immediate mortality or loss of time and the immediate expense is of no great amount. Such reasons seem insufficient to justify the wearing of a truss except as a temporary measure while the patient's affairs and health are being prepared or as a makeshift arrangement in the aged or infirm.

The third procedure for one with a hernia to follow is to accept the radical operation cure. It is to our mind regrettable that the prospective patient does not comprehend the operation. The separation and ligation of the sac followed by the anatomical repair of the muscles is one of the most perfect operations and would be sure to appeal if viewed from a mechanical standpoint. The operation is a most flexible one. Flabby or improperly developed muscles can be overcome by the utilization of other neighboring muscles. The extremes of age are of themselves no contraindications.

The repair may be done under local, regional, spinal or general anesthesia. The mortality in non-strangulated cases averages less than ½%. The convalescence is generally practically painless and within two weeks the patient is out of bed, within five to six weeks more able to resume light work and in another month rather heavy work. No truss is needed subsequently.

One who has been successfully operated is and should be made to understand that he is practically as sound as anyone who has had no hernia.

Statistics regarding recurrence of inguinal hernia vary from 1-10% being dependent upon many conditions, probably 3-4% being the average. Among the direct variety the rate is considerably higher. It seems particularly fortunate that the best results are obtained in those who have the longest expectancy to enjoy them.

The average young man of intelligence will have no difficulty deciding which of the three routes he should follow if the disease and its treatment are explained as above. It would be most profitable for employers to have all prospective employees examined. Much future controversy would be prevented, more hernias would be discovered and repaired earlier in life with resulting increase in happiness, prosperity and longevity for those affected and also their families.

Summary

(1) About 2% of all male adults have definite inguinal hernia and perhaps another 2% have enlarged rings.

(2) A vast number of these patients do not apply for operative treatment; probably due to misunderstanding of methods employed and results obtainable.

(3) General practitioners have definite opportunity for

preventive medicinal work in this field if they will impress upon patients the dangers of strangulation, ineffectiveness of trusses and the impairment of activity often resulting from hernia.

(4) Industrial concerns can protect themselves and their men by making examination of inguinal rings routine before employment and urging operative repair.

(5) In vast majority of cases the radical operative cure of hernia is the most effective method of treatment and this applies to all types.

DISCUSSION

Frank T. Fort, Louisville: Hernia has always been an interesting subject to me, and it was made more interesting during the late World War. I feel it is not necessary to consider the mortality in the discussion, because it is practically nil except in strangulated hernias. The morbidity is what we are trying to keep lowered.

Hernia, as we know, is a protrusion. While the Compensation Board claims that there are traumatic hernias, I have never seen one. I think there is a potential hernia existing for months or years, and stepping down off a sidewalk will do the same thing as lifting. So I think we can pass that by.

As to the treatment of the respective hernias, I feel it is well for all of us to take advantage of the dead-room and examine the tissues very carefully and get our technic to a certain extent. Then we can learn the different masters' operations and have those at our finger tips, not that we will use any one of those operations in any respective cases, but we should know them all. Halsted, Bassini, Ferguson, Andrews, and one or two others give us most of the important operations. You make up your mind, after you get in, what one of these, or combinations of them, you will use. In operating on double hernias, I have used one method on one side and another method on the other. The larger the hernia, I think, the better indicated Bassini's operation is, to cut back from the internal oblique and close up the old internal ring and then leave the cord outside. In other operations, the Ferguson is splendid.

Relative to trusses, I feel no one should use a truss. It only complicates matters. After a patient has worn a truss for years, the trusses seem to absorb underneath where the truss was worn, you have very little musculature, you have to borrow from the sheath of the external rectus and other adjoining spaces to fill in, and in these you have an increased morbidity at times, because it is almost impossible to do otherwise.

I think we have about discarded the use of the filigree which was in vogue for a long time. I believe everyone has practically discarded the use of injections. I remember having operated on two patients who had been injected. We had something resembling soap balls. A patient came to me one time with a lot of balls in his hand and said, "See what 'Fruitola' did for me. I had gall stones and here are the gall stones. I know they are gall stones." To satisfy him, I

took them to a chemist and we examined them. They were nothing but soap balls. It is astonishing how people will grab after things rather than have a nice clean operation.

To my mind, a nervous patient should always be completely anesthetized, that is ether and anesthetization. In a more phlegmatic person, one less nervous, local anesthesia is ideal, although we have to think of the tissues lying over the inguinal space. They are really more vulnerable than a great many other tissues of the body. Infiltration anesthesia very often gives a low degree of infection that will heal. If I can do a block anesthesia, it is all right, but I don't like to inject into the superior inguinal glands, for the reason that you can have a low grade infection.

I don't know of any operation that requires better technic or stricter asepsis than a herniotomy. With several hundred I have operated, I think I have had, in selected cases, about one-half of one per cent, so far as I have been able to trace, morbidity. In other cases the morbidity is greater.

There is a hernia that is not spoken of very often, of which I have had two cases, and that is Richter's hernia. One came to me with apparently an inguinal abscess. In opening it, I found it had fecal matter. It had cured itself. One portion of the bowel had inserted itself through the ring and become constricted and it broke down.

The other case I came across within an hour after it happened and did an immediate operation, and it was so tight that I had to insert a knife from without and cut into the ring, and as soon as I did, it got away from me. If it had been gangrenous, I would have had an awful time. It jumped in so quickly that I was never able to find the bowel. I just gambled on its not having been strangled enough to die and the man made an uneventful recovery.

I think every herniotomy should stay in bed for at least three weeks, and some of them longer. You can take a chance on some of them getting out a little earlier than three weeks, of course.

Dilation of Ureter in Male.—In 185 consecutive autopsies on males, Carson says ureteral dilation was encountered in twenty-three cases (12.4 per cent); it was bilateral in fourteen, rightsided in five, and leftsided in four. Dilation of the ureter was accompanied by hydronephrosis in thirty-one instances (88.5 per cent). Infravesical obstruction was the etiologic factor in eleven cases (47.7 per cent). Ureteral stricture was found in five cases, four of inflammatory origin and one congenital.

PRESENT DAY KNOWLEDGE OF DISEASES OF THE RECTUM AND COLON AND THEIR RELATION TO REMOTE DISORDERS.*

By WM. E. APPLEHAUS, M. D. Louisville.

The past few years have been productive of more genuine study and a clearer understanding of diseases of the rectum and colon and their relation to general health than has ever before been accomplished over an equal period of time. Probably no branch of medical science has undergone more radical changes, or received such sudden recognition of their importance in explaining and relieving hitherto obscure ailments, as have the diseases of the lower bowel.

Heretofore we have considered the affections of the lower bowel as chiefly local and treated them accordingly. The addition of proctoscopic examinations as a routine procedure in diagnostic studies and the prompt recognition and treatment of these diseases has demonstrated the important role they play in systemic or remote disorders.

Ano-recto-colonic diseases can be roughly divided into three classes, namely: non-inflammatory, infectious and parasitical types. The non-inflammatory type includes malformations, adhesions, benign tumors, all types of malposition, specific strictures, diverticulosis and malignant growths.

Malformations of the rectum and colon are very rare and consist chiefly of absence of part of the colon or some form of atresia. The abnormalities of the peritoneum or mesentery are more common and vary from the caecum having a short mesentery, to that in which the caecum and ascending colon and half the transverse colon have a common mesentery with the whole of the small intestine. The length of the sigmoid is also varied.

In some cases a sigmoidoscope cannot be introduced beyond the promontory of the sacrum, while in other cases the sigmoid can be lifted into the upper part of the abdominal cavity. These cases of extreme redundancy usually produce marked stasis with its train of symptoms and are very liable to result in volvulus of most complicated characters.

Ptois is both congenital and acquired. The acquired forms are due to loss of weight, loss of tone of the abdominal muscles or a chronically filled bowel continually exerting its weight on its attachments. Ptois is of no great importance if the bowel can properly empty itself regularly and completely.

Megacolon and microcolon are extremely rare but are easily diagnosed by x-ray.

Adhesions involving the colon are very

common. They vary from a single band, kinking or partially obstructing the bowel, usually resulting from a local inflammatory lesion in the colon as an ulcer or inflamed glands, to dense, extensive adhesions, often the result of peritonitis from a previous abdominal operation. Very often we see cases in which we can offer no explanation for the cause of adhesions.

Benign tumors of the rectum or colon are exceedingly rare. The main ones are myomata arising from the muscular coats of the bowel, angiomas which are congenital, multiple adenomas due to infection of Bilhorzia Hematobia, papilloma and multiple polyposis. Polyposis is of especial interest as there is no benign process in which there is a higher incidence of ingrafted malignancy.

There has long been ardent discussion as to the importance of syphilis in the production of strictures in the rectum and colon. Some writers have stated that all strictures of the large bowel are due to syphilis. While lues does play an important part in producing strictures we believe that many of the fibrous strictures are the result of long standing chronic inflammations. Spasmodic strictures, while rare, may occur at any portion of the large bowel and cause pronounced obstruction.

Diverticula or local pouching of the mucous membrane may be found in any portion of the gastrointestinal tract except the rectum. They occur more frequently in the colon than any other part of the tract. It is usually considered a disease of advanced life, however, cases have been reported in patients as young as eighteen years. They are not considered harmful in the small bowel due to the liquid condition of the contents. They only become pathological when they retain solid material. Since the contents of the colon increases in solidity as it passes down the bowel, and as germ life becomes more violent nearer the outlet, the most frequent site of inflammation of these diverticula are in the sigmoid and descending colon.

Diverticulitis is of importance in that it may stimulate other inflammatory conditions of the abdomen, including appendicitis, cholecystitis and pelvic inflammatory disease. The definite diagnosis of this condition preoperatively is made by x-ray.

The most frequent site of cancer in the large intestine is in the rectum and lower sigmoid. Eighty per cent of the cases are ano-recto-sigmoidal. The sites next in order of frequency are, caecum, hepatic flexure, splenic flexure, descending colon, transverse colon and lastly the ascending colon.

Fully developed cancer wherever located in the large intestine usually produces fairly

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typical symptoms, alternating diarrhea with constipation, colonic distension, soreness, tenderness, mucoid discharge and loss of weight. Unfortunately, early cancer of the large intestine gives rise to but few symptoms, and, unless greater attention is paid to vague manifestations referable to the intestinal tract, and more thorough diagnostic studies made, cancer will rarely be recognized early enough to greatly benefit the patient.

The symptomatology of the non-inflammatory group is more or less typical and the effects on the patient are rather well defined. The increasing use of the proctoscope and barium enema and x-ray have readily identified these disorders and they are now receiving adequate treatment.

Our understanding of the inflammatory type of ano-recto-colonic disease is not so clearly defined and is, in the main, still in the formative state as regards to etiology, relation to other diseases and methods of treatment.

This group embraces all forms of colitis, sigmoiditis, proctitis and nearly all recto-anal diseases including hemorrhoids, abscesses, fissures, fistula, cryptitis and the great majority of pruritic cases.

Any of these inflammatory diseases may affect various parts of the colon or even the entire large bowel. While the pathology may be similar in character in any portion of the bowel affected, the symptoms may vary widely depending upon the locality of the disease. As a rule these inflammatory processes extend downward and not from below upward.

A great deal of investigation has been done to determine the exact cause of these inflammatory manifestations. Some authorities have taken the stand that the infection is primary in the large bowel. It is our opinion, however, that a great many of these cases are either the aftermath of some constitutional disease or they are secondary to foci elsewhere in the body, namely: infections of the teeth, gums, tonsils, posterior nares, accessory sinuses, gall bladder disease and appendicitis.

We have seen a great many such cases following attacks of pneumonia and typhoid fever. In taking histories of a great many of these cases, I have been profoundly impressed with the large number that begin with attacks of influenza.

Thus far, unfortunately, the immense volume of work done on the bacteriology of these cases has not thrown much light on the subject. We speak of the hypertrophic form of colitis in which the mucosa is congested, reddish and moist. These patients as a rule are

not constipated and pass large quantities of mucus.

In the atrophic form we find the mucosa thinned out, shiny looking with dry mucus and fecal particles adhering to it. The infection in this case has partially destroyed the mucous glands. These patients are usually constipated and complain of toxic symptoms.

In granular colitis we find each follicle swollen and projecting above the surface. While in membranous colitis the superficial layer of the mucosa, or entire casts of the bowel, are shed at intervals.

In chronic ulcerative colitis we still have another picture. The entire mucosa or portions of it are covered with small superficial ulcers or there may be large areas of denudation of the superficial layer of mucosa. Ulcerative colitis may be due to ameba, tuberculosis or various types of germ life, the identity of which has not yet been fully determined. The literature describes a type of ulcerative colitis which to me is rather vague for the reason that no specific organism has yet been proven to act as the causative factor.

Very frequently the secondary infection in the colon is far more intractable than the primary cause. Hence, the removal of septic or toxic foci does not always relieve them and the colon may be dispensing secondary products of infection after the primary ones have been effectively dealt with, that are more far-reaching and disastrous to the health and well-being of the individual than the primary cause was. An eminent authority once said that it takes two years of energetic treatment to cure a case of colitis and then they will not be entirely well.

When we consider the anatomy of the colon with its entire mucosa thrown into almost continuous folds, lined with glands and follicles and always possessing the optimum moisture and temperature at which bacteria thrive, we can readily appreciate the truth of this statement.

The normal mucosa of the large bowel plays a dual role. First, absorbing water and nutritive substances, the threshold substances if you please, and secondly, a protective function in preventing the absorption of toxic material or non threshold.

Whenever the normal function of this protective lining is interfered with either by trauma, infection, ulceration or chronic irritation and denudation by drastic or long continued purgation, large amounts of toxic materials are absorbed into the circulation and may produce any remote ailment whatsoever that is due to toxic origin, including rheumatoid arthritis, mental depression, vis-

ual disturbances, nervous irritability and skin lesions.

The successful treatment of inflammatory infections of the large bowel centers chiefly around the removal of all septic foci above careful dietary regulations, adequate constitutional treatment and well appointed local applications to the mucosa itself in the form of medicated colonic irrigations. Proper cleansing and drainage is just as essential in inflammatory conditions of the colon as in any other type of infection. The use of laxatives are not even a poor substitute for enemas in these cases.

The climax of these colon infections are the so-called rectal diseases. As long as the infection remains in the tissues above the anorectal line which are supplied by the sympathetic nerves we may have no definite symptoms referable to these parts but if the infection invades the tissues below the anorectal line which are supplied by highly sensitive cerebrospinal nerves we instantly have marked symptoms. The mere fact that a patient complains of no definite symptoms, referable to the terminal bowel does not preclude the absence of rectal disease.

This infection may be limited to the mucous membrane, extend into the crypts of Morgagni known as cryptitis, or permeate the mucous layer and attack the subcutaneous structures, producing any type of abscess from a small submucous to a complicated ischio rectal abscess, depending on the virulence of the organism and the resistance of the patient. Abscesses which are the antecedents of most rectal fistulae are not the direct result of kicks or trauma to the anus or surrounding structures. These traumatism only serve to activate an old infection already implanted in the tissues. Neither would fissures occur following the expulsion of a large constipated stool if the tissues were not already in a semi necrotic state from this old low grade infection.

The exact status of hemorrhoids is yet uncertain; some authorities contending that they are due to a congenital weakness in the terminal venous plexes. We do not dispute this theory but feel certain that while this may be a predisposing factor yet the actual cause is a low grade infection in the overlying mucosa that destroys the connective tissue support and allows the vessels to distend.

In 1922 Hanes in his presidential address before the American Proctologic Society called attention to the diseased condition of the perianal and perirectal tissues in pyrritus ani. He found in many of these cases a complete destruction of connective tissue which he attributed to the action of low grade bacteria or their toxins. By making incisions

into these potential cavities, and allowing them to drain and heal by healthy granulation, he observed that patients were not only relieved of their local ailments but many were cured of some remote condition, suggesting the possibility of the rectum as a focus of infection.

The important point to remember is that many rectal diseases are the direct result of infection and that all rectal diseases are constantly exposed to infection which is brought down by the fecal current making them a fruitful source of focal infection.

The colon bacillus out of its normal habitat as in eroded hemorrhoids, fissures or rectal sinuses and in the presence of mixed infection is pathogenic. The literature in the past few years has been replete with incidences of focal infection due to the rectum.

At the Hospital for Joint Diseases in New York City, where special attention is given to treatment and diagnosis of focal infection, Goldman has collected a series of several hundred cases in which rectal foci were responsible for arthritis of the Monoarticular and Polyarticular type.

J. W. Visser in the U. S. Veterans Bureau Bulletin reported two cases of pancreatitis and diabetes whose conditions were markedly improved by surgical treatment of rectal conditions.

Pennington, in the J. A. M. A. Vol. 87, No. 25, states that all hemorrhoids are infected or potentially so. We could easily cite from our own practice a hundred cases where gross rectal lesions were true foci of infection.

There is still another class of rectal disease that is scarcely mentioned yet its effect on general health and remote disorders is proportionately more disastrous than the readily recognized gross disorders. These patients complain of no definite symptoms referable to the rectum.

Infection of the perianal and perirectal tissues with no gross complicating lesion is without doubt the most confusing of all affections in the rectal outlet. If there is a fissure, ulcer, hemorrhoids, stricture or any tangible lesion present there is then an unmistakable reason for local and other symptoms but when patients complain of most severe unclassified symptoms and nothing can be found that may account for them it is then that we lapse into the use of such vague nervousness, functional disturbances, etc.

Whether any of the ordinary gross lesions that are observed in the anal structures are present or not large irritable and tightly contracted anal muscles, which vehemently resist the introduction of the finger or any foreign body into the rectum, indicate local dis-

ease. If all the layers of the anal wall, the muco-cutaneous, connective tissues and the muscular layer are in an irritable and chronic state of inflammation, all the conditions for the production of many annoying symptoms are present, either reflexly or as a focus of infection.

In some of these cases there will be an almost total destruction of the connective tissues surrounding the outlet of the bowel. The perianal skin will be redunant and discolored. (This excessive pigmentation is not a natural condition as frequently taught but indicates a lack of nutrition and a diseased condition of the underlying tissues.) The perineal floor is usually relaxed and the anal muscles sensitive. This type may produce reflex symptoms but more often is a focus of infection. In other cases the anal muscles will be tight, hypertrophied, spastic and extremely irritable; the pelvic floor is rigid and contracted, producing the so-called infundibuliform anus. The perianal and perirectal structures seem to be fibrosed and may contain deposits of fibrous tissue. This type of case usually produces reflex symptoms to the upper gastrointestinal tract and genitourinary tract in addition to the severe systemic nervousness. The extreme of this type of case is often referred to as the "goosey" person. Simply pointing the finger toward the anus invokes the most fervent and frenzied pleading to come no closer.

The reason these types of rectal diseases are not recognized is due to the fact that we have been trained to think in terms of gross lesions and classic symptoms instead of routine examinations.

Time will permit of citing only a few cases: A young man with a severe neuritis in his right arm was referred to us for examination and advise. Badly diseased tonsils were removed a year previously with no apparent relief, his teeth, sinuses and prostate were carefully examined but no foci found. He had repeated complete diagnostic studies made but no light was shed on the cause of his trouble. We found that he had a marked discoloration of the perianal skin, sensitive anal muscles and a low grade colitis. He was advised of our findings and that it was impossible to state positively that this condition was the cause of his trouble. He decided to have it attended to and after the third injection of 1-3000 hydrochloric acid into these diseased tissues his neuritis was cured and has had no recurrence for the past three years. While the tonsils were undoubtedly the primary cause of his trouble, the secondary infection in the colon and rectum was probably producing more trouble than the tonsils.

We have had many cases of lumbago and sciatica that were unquestionably due to an infection in and about the terminal bowel and we believe both of these affections warrant a complete examination of the rectum and colon. We have just recently seen three cases of priapism. All of these men had been the rounds of urologists and received no benefit. Neither case had any gross rectal lesion. They had tight spastic muscles that seemed to be incorporated in dense masses of fibrous tissue. All had a marked discoloration of the perianal skin. The first case was operated upon, the anal tissues were removed and large incisions made on either side and along the rectum, the fibrous tissue was cauterized, the wounds packed and allowed to heal by granulation. The anal muscles were kept dilated. This man was free from his symptoms immediately after operation and has remained so for a year. In the other two cases 1-3000 Hcl preceded by novocaine was injected into these tissues. After the needle pierced the skin it could hardly be introduced into the hard fibrous tissue. After several treatments the stimulating effect of the Hcl caused a softening of the fibrous tissue with relief of the symptoms.

Twenty years ago Hanes called attention to the close interrelation of rectal disease and urinary disorders. His observations at that time were based on cases on which he operated for rectal complaints with subsequent relief of irritable urinary disturbances. Today many urologists believe that irritable conditions of the bladder, where careful examination reveals no pathology in the genitourinary tract are reflexly due to rectal disease.

We have had several cases of dysmenorrhea that were relieved when rectal and spastic sigmoidal conditions were cleared up.

The effect of rectal disease on upper gastrointestinal tract symptoms are indeed manifold but are nearly always due either to a reflex disturbance of the sympathetic system or absorption of toxins.

The object of this paper is not to deal with the detailed differential diagnosis of these diseases but to present to you in its broader sense, the important part diseases of the rectum and colon play in producing systemic and remote disorders. I quoted the above cases simply to show that investigation of the terminal bowel must be included in our diagnostic studies.

Today we are just at the dawn of a new era. We know nothing as yet of the intestinal flora or its share in producing constitutional ills or its effect upon prolonging life. Our hopes for a clearer conception and ultimate complete understanding of the dis-

eases of the terminal bowel and general health lie in the recent awakening of the profession to the importance of these ailments and the general trend to incorporate a complete investigation of these parts in our routine examination.

DISCUSSION.

J. R. Wathen, Louisville: I think such a valuable paper as Dr. Applehaus has presented should not go unnoticed. We have been entertained and very much instructed.

His association for many years with Dr. Hanes has given him a large clinical experience.

Kentucky is unusually fortunate in having had some of the pioneers in this work. Dr. Matthews, having been trained in his early days abroad, came to this country and gave us ideas that were new to us all. We have continued to develop them in Kentucky under such men as Hanes and Applehaus.

I feel that in general surgery and general medicine there is no field that has been so poorly explored as the rectum. It is possibly due to several things. In gynecological work we can easily locate the lesions by direct observation. It is very hard in the rectum, by methods of examination, to locate these lesions. That is why we have made so little progress. The same is true of the brain; the brain is very hard to get to and is hard to examine. The rectum is hard to examine.

I think the table Dr. Hanes has presented to the profession is of great help in examining the rectum. I am quite sure if we will look just a little farther in our location of disease, we will find the rectum is the offending organ in a great many of our cases that become chronic and are not cured.

Not long ago I had operated on a case of fibroid tumor of the uterus, and it was a very successful operation. The woman then came to me for bladder trouble, frequency of urination. I referred her to a prominent urologist. He could find nothing there. When we referred her to the rectal specialist, Dr. Hanes, we found a great deal of pathology there.

I believe the chronic cases of colitis and proctitis are much more frequent than we believe. If we will make more careful examinations and watch these cases we will get better results.

As far as treatment is concerned, we are just beginning to know something about it. It is in its infancy. It is interesting to read the new book of Lockhart Mummery of London, who brings out many new ideas in regard to treatment.

I feel Dr. Applehaus' paper is very timely, and it should be of great value in one respect especially, that is calling our attention to these chronic invalids and letting us examine the rectum and locate the trouble.

George A. Hendon, Louisville: This subject

possesses points of interest that are peculiar to itself. All of us who are accustomed to doing abdominal surgery recognize the fact that if the course of an operation inside the abdomen, the rectum or the lower colon is wounded and contents are allowed to soil the abdomen, that patient will almost surely die. Every gynecologist who has had experience in hysterectomy I believe will bear me out in that statement. If in the course of the removal of the uterus, an opening into the rectum is accidentally made, as occasionally happens, due to adhesions and other adverse circumstances, and the contents are allowed to soil the cavity, that means almost certain death.

That proves conclusively that the organisms in this part of the body are possessed of an intensified virulence which is due to a combination of the soil and climate in which they live. As we proceed from above down in the intestinal tract, the more virulent the organisms become; not only more virulent, but more abundant.

If the mucous membrane of the bowel is preserved in its integrity, it has a special form of tolerance that will protect the general system from the invasion of these organisms of such high type of virulence; but if, under some adverse circumstance, the resisting power of the mucous membrane is reduced and the organisms which reside in this particular region thereby penetrate into the wall of the intestine and gain entrance into the general circulation, they carry this intense virulence with them.

Ulceration is a slow wound. Slow filtration of bacteria through ulcerated areas produce remote effects rather than immediate results and the gravity of the effects depend on the virulence of the germ. Therefore, an ulcer in the rectum is of supreme importance because it allows entrance of bacteria of special virulence and a more remote destiny. It will produce conditions that are hard to diagnose because of the fact that the source is so frequently difficult to determine.

I have been convinced for a long time that the majority of cases of backache that have been classified as lumbago (which comes from the two Latin words "lumbo," meaning I don't know, and "bago," anything about it) can be classified as the beginning symptoms or the early evidences of ulceration in the lower intestinal tract, in the sigmoid and in the rectum, more particularly in the sigmoid.

In what we know as diverticulitis or diverticula of the sigmoid, I believe that the symptoms, first, are vague pains that occur in the lumbar region. I believe they are more often indicative of a breaking in the wall of the mucous membrane of the sigmoid than they are of any dyscrasia or any disease concerning the sacroiliac or any other joints in that region.

Granville Hanes, Louisville: I wish to state that my mind has changed very much with regard to lesions of the terminal bowel from opinions that I entertained twenty years ago. I believe if we would take time to carefully investigate the various rectal diseases which come under our observation we would find that they are secondary to some diseased condition or disorder that exists higher up in the tract. It is possible that some disturbances may have developed in the upper part of the tract and have been relieved with, however, a secondary manifestation in the terminal bowel. It is the correct view, in my opinion, to entertain the belief that long continued disorders in the upper digestive system almost without exception produce some type of pathology in the sigmoid and rectum.

Of course, I do not include such types of pathology as cancer, stricture, polypi and benign tumors of various kinds. I do, however, include hemorrhoids. Text books almost universally give constipation as the chief cause of hemorrhoids. It is true that constipation may excite the presence of hemorrhoids by straining but there must be some extraordinary condition present which allows hemorrhoids to occur as a result of straining in some cases and not in others. For instance, in dysenteries and diarrhoeas where there is a great deal of straining hemorrhoids are not complained of in many instances. Straining is only an exciting cause of hemorrhoids. I feel very sure that the primary condition which is responsible for hemorrhoids is a destruction of the connective tissue, to a greater or less degree, which binds the sub-mucosa to the muscular coats of the rectum. The hemorrhoidal vessels are supported by the sub-mucosa and when the sub-mucosa's attachment to the deeper structures is interfered with straining pushes the mucous membrane and the sub-mucosa with the blood vessels out of position and, therefore, produces a mechanical condition which results in hemorrhoids.

I make this statement for the reason that we have injected into the sub-mucosa 1-3000 hydrochloric acid with astonishing results. The fluid was not introduced into the tumor but into the sub-mucosa above the tumor. With the finger in the rectum, when the fluid was injected, the mucosa was often raised from the deeper tissues in a most irregular and tortuous fashion. I interpreted this phenomenon to indicate that the connective tissue had not been effected in a way that was at all uniform. The fluids naturally traveled along the lines of least resistance or where the destruction was most complete.

The irritating effect of the acid produces an influx of blood to the parts and as a consequence the plastic deposit is converted into a new connective tissue which holds the parts in

apposition and in this way relieves the protrusion.

Patients often, when advised to have their hemorrhoids removed, insist on having some method of treatment employed whereby they may escape going to a hospital. When they have uncomplicated internal piles they can be easily cured as herein described.

We have treated large rectal prolapses in the same manner, but in order that the plastic deposit may have time to organize into fibrous tissue the patient is advised to inject water into the rectum and rest on a bedpan when the bowels act. So, after injections for the hemorrhoids patients are advised to inject warm water when sitting on the toilet to aid the bowels to act with as little straining as possible. If much constipated a mild laxative may be given.

It seems evident that there is a low grade infection, not active enough to produce ordinary inflammatory symptoms, in the rectal tissues of a large percent of individuals. This is the type of infection that destroys connective tissue. It may be insidiously operating for years with but little discomfort to the patient but when more active germs invade the tissues real inflammatory symptoms develop.

The most deadly germs found in the entire alimentary tract are at its terminal portion. We have in these tissues the most insidious and least active and the most malignant bacteria.

More than a year ago I was called to see a patient who had fallen ill the afternoon before. When I saw her at 9 a. m. she was complaining of terrific pain in the lower abdomen with an urgent desire for the bowels to act. There was a necrotic line in the posterior anal wall. The family doctor was called. Her distress was never relieved nor was it possible to get her bowels to act. She died early in the afternoon. I have seen six cases with similar infections. Four recovered and two died within thirty hours.

In pruritis ani the low grade infection destroys the connective tissue under the skin and it is here that the disease has its origin. The skin is involved secondarily. Local applications are not effective because they do not reach the source of the disease.

The same holds true in eczemas. The connective tissue beneath is primarily affected and the surface becomes secondarily involved. Hydrochloric acid injected under the skin, as in pruritis ani, will give prompt relief to many patients.

The question of backaches was referred to by Dr. Hendon. Many patients, as you know, complain of this trouble. In a large per cent, not all by any means, the pathology responsible for pain can be observed through the proctoscope.

It is often very difficult and dangerous to introduce a proctoscope well into the sigmoid

where these lesions are frequently found. The inverted position, over the edge of a bed, a trunk or a specially designed table with the abdominal muscles well relaxed is undoubtedly the best method of procedure.

If the patient does have a backache due to a diseased sigmoid that part of the bowel is, almost without exception, spastic and extremely sensitive. Passing a proctoscope by the sacral promontory into the sigmoid above is seldom accomplished in these very sensitive patients. Even though the patient is inverted the abdominal muscles are invariably tight which forces the bowel wall into the distal end of the instrument. Until the wall of the gut drops away from the end of the proctoscope efforts to push the instrument further into the sigmoid is a dangerous manipulation. It is at this time that a teaspoonful of one-half per cent novocaine may be poured into the proctoscope and all the persuasion possible brought to bear on the patient to obtain relaxation of the abdominal muscles.

Until the instrument is introduced well into this part of the sigmoid the pathology can not be understood. After the introduction has been made, moving of the distal end of the proctoscope to either side causes the most acute pain. Under these conditions the nurse is left with the patient ten minutes or longer to relieve the spasticity by gentle motion of the instrument.

The distal end of the proctoscope, after its introduction, often points decidedly to one or the other side. This shows that there is not only a pathology in the sigmoid but that there is an adhesion or some pathology in the meso-sigmoid.

These patients are greatly relieved if three or four ounces of a solution of argyrol, mercurochrome, ichthyol, etc., are poured into the bowel while inverted, and retained. The diet should be properly supervised, enemas given each morning with the inverted treatments repeated every three or four days.

J. G. Sherrill, Louisville: In 1886, about forty years ago, I had the pleasure of first listening to Dr. Matthews, the premier and the first rectal surgeon of this state. I have seen the development of rectal surgery from that time to this. In those days they looked through, if they looked at all, a little instrument about an inch long, with the patient turned on the back, and so forth.

I was pleased to be with Dr. Hanes twenty years ago, when he first began to turn the patients over; he started a little bit and kept on turning them over until he got them straight upside down, the patient with his head down,—quite an uncomfortable position, but on Dr. Hanes' table a very good position—and, if he did nothing more than that, he should be commended.

Dr. Applehaus is the third generation, and I must say, for a maiden effort, he has kept up very well with those master surgeons who preceded him. He has the vision of youth.

The trouble about specialists, as I see them, is that they view their work through a microscopic position and, therefore, they are not likely to spread out in vision. Hanes has spread out, however. He has gone wider than most rectal surgeons; he sees from the anus to the mouth without any difficulty.

There was a group in the old days that were known as the Glee Club, and you will remember it. I don't have to tell you what Glee Club it was, but was Matthews, McMurtry and Wathen. Today the Glee Club sang again—Wathen, Hendon, Hanes—the same Glee Club, gentlemen, and they are doing a good work. Occasionally, they get out where you don't agree with them. Why, Hunter sees everything through a cystoscope, every single tonsillitis, everything else is caused by some trouble in the ureter. Everything is caused by trouble in the sigmoid or rectum according to the rectal specialists. That is not true, but the profession should learn this one thing, which is the important part of this paper: don't examine the patient by looking at his face and writing a prescription and saying: "Go home and get well." He does not do it.

The main thing to be impressed on the medical profession is to examine the patient from top to bottom, and turn the bottom over and look in. I will guarantee that you won't diagnose a case of amebic dysentery unless you do that.

Dr. Hanes gives more time to his patients than all the rest of us put together, and he is the best salesman in the United States, barring none. The results are that, every now and then, he gets a cured patient, which some of us do not. He will take that patient and put him up in the proper Hanes position, and will take the long instrument that reaches quite a distance and will scrape some tissue off of an ulcer that nobody else has been able to see, except a few men working like him. He brings that out, puts it on a microscope, and shows you the living ameba wiggling around. That is work.

The main thing for the practitioner to learn is that every case should be examined from top to bottom, and, if you don't know how to look into the rectum and observe things there, you are going to overlook a lot of symptoms of which your patient complains.

Hanes has come to the conclusion that beginning with the teeth, the tonsils, and all the way down, finally the disease reaches the rectum and him. He is trying to get it into his class, don't you understand? Generally, he is right. It is one of the most fertile soils in the world, and in the rectum grows the worst bacteria in the world. The resisting power of the

lining membrane, the sigmoid mucosa, is so great that the percentage of infection is low.

I wish to thank the doctor for his paper, which I take to be a very classical paper for a maiden effort before this body, which is really what I rose to say.

William E. Applehaus, (in closing): I certainly want to thank the gentlemen for their very kind and most generous discussion of this paper. Several new points were brought out and I greatly appreciate the steadily growing interest of the profession in this field of medicine, and their most cordial reception of my paper.

CASE OF AURICULAR FIBRILLATION TREATED WITH QUINIDINE.*

By J. ROWAN MORRISON, M. D., Louisville.

Mr. A. H., aged 60 years, came to see me November 16th, 1926. He complained of "getting sore all over" at night, and had to get up three or four times to urinate. He was very much constipated, but his appetite and digestion were good. He was "short of breath" only when walking up stairs.

Examination of the heart showed several irregularities per minute, presumably extra systoles; rate 96, no murmurs, no enlargement. The disturbance ceased very quickly after rest. There was no swelling of the feet; no enlargement of the liver. The patient had typhoid fever many years ago; no acute articular rheumatism; no scarlet fever; history negative for lues. He very rarely had tonsillitis; teeth in good condition.

I considered his indisposition to be due to improper elimination through the intestinal tract, the consumption of too much rich food, and improper rest; as he told me he was going to cabarets and remaining out late at night dancing, etc.

On November 17th his urine was practically normal. The phenolsulphonephthalein test showed total of 47 per cent in two hours. Non-protein nitrogen 27 mgm. per 100 cc. He was advised to rest more, to adopt a simplified diet, and to take two grains of quinine sulphate three times daily for the irregular pulse. He did this, and returned to me December 3rd, 1926, at which time he felt much improved and had very infrequent irregularities. His weight had declined from 176 to 169 pounds and he seemed to be much stronger and better.

I did not see the patient again until December 28th, 1926, when he called me complaining that after too much indulgence in dancing, eating and drinking, he became suddenly weak and "felt the sensation of a bird

fluttering in his chest." I found that his pulse was apparently totally irregular, that he was very short of breath and weak. He was placed absolutely at rest and given an hypodermic injection of 1-6 grain of morphine. That same afternoon he was very much better, although his pulse was still very irregular.

An electrocardiogram taken the morning of December 29th, 1926, showed auricular fibrillation. He was given quinidine sulphate, three grains every five hours, until he had taken eighteen grains. At that time I was called and told him to repeat the dose of quinidine, making a total of twenty-one grains at five hours intervals. The sensation of fluttering in his chest had ceased. His pulse when I saw him was regular; rate about 80 per minute. The quinidine was discontinued and he was told to keep extremely quiet.

On January 4th, 1927, he was well enough to come for another electrocardiogram which showed a normal sinus rhythm with rate of 67 per minute. He returned to his room and rested for ten days further, neither quinidine nor digitalis being administered.

By that time he felt so much better that he insisted upon returning to work. He was advised to be very careful and to go to his office in a taxicab, and to use an elevator for going up and down stairs.

I saw him only a few times afterward, as he felt so much better that he would not come to see me, and soon returned to his usual habits of walking up several flights of steps at his office, and before long resumed his usual ways of living.

I saw him several times in the spring of 1927. There had been no return of the irregularities. The last time I saw him was in the autumn of 1927, when he was going at a rather rapid pace, but said there had been no further trouble with his heart. I understand he has been in Cuba the past winter and has been having an excellent time.

DISCUSSION

Emmet F. Horine: The question of the administration of quinidine in the treatment of auricular fibrillation is an interesting and most important one. All patients with auricular fibrillation should certainly not receive quinidine but in selected cases the drug is of great value.

No patient should receive quinidine in any quantity until a preliminary test dose has been given to determine if any idiosyncrasy to the drug exists. Patients with abnormal sensitiveness usually manifest it either by tachycardia, severe headache and tinnitus or gastro-intestinal disturbance especially a diarrhoea.

There are certain other definite contra-indications to the administration of quinidine in these cases. One is a long duration of the irregular-

*Read before the Louisville Medico-Chirurgical Society.

ity. Even though fibrillation has been known to exist for a long time there is a chance of restoring normal rhythm with quinidine but there are possible dangers from its administration which should not be overlooked. In long standing fibrillation intra-mural auricular clots may be present and, should normal rhythm be initiated, portions of these clots may be liberated to find lodgment in the brain or elsewhere with serious if not fatal consequences. Certainly no case with a previous history of embolic phenomena should receive quinidine.

Another contra-indication to quinidine therapy is the presence of marked myocardial changes with congestive heart failure or failure of the anginal type. In patients having widespread myocardial changes, even though sinus rhythm is restored temporarily, early reversion to fibrillation is the rule without the patient being really benefitted. Digitalis is the drug of choice in long standing fibrillation as it is in fibrillation occurring with marked myocardial changes and in such cases a maintenance dose should be given throughout the remainder of the patient's life.

The type of case that I have found particularly suitable to the administration of quinidine is one with very little, if any, myocardial change; with fibrillation having existed for a short period and with the general condition of the patient good. In this type of case sinus rhythm is very frequently restored with marked benefit. It is best to digitalize the patient in order to slow the ventricular rate prior to the administration of quinidine. After restoration of sinus rhythm I usually reduce the dose of quinidine to ten grains daily and continue at this level for about ten days when the drug is discontinued.

I may say that Dr. Morrison had a very excellent response to quinidine in the case reported because ordinarily very much larger doses of quinidine are necessary before restoration of normal rhythm occurs. In most cases forty or fifty grains daily are required. If one does not accomplish the desired result with a daily dosage of as much as fifty grains of quinidine for two or three days it is not advisable to continue longer. Dr. Morrison's patient shows how much good may be accomplished by restoration of normal rhythm in that his patient was able to resume his former occupation.

I think the dangers of quinidine therapy have been somewhat exaggerated due perhaps to the fact that practically all types of patients presenting fibrillation have been regarded as amenable to this form of therapy. My experience, dating back six years, with this drug indicates that, in properly selected cases, spectacular results may often be accomplished. Certainly when normal rhythm is restored by the adminis-

tration of quinidine great benefit accrues to the patient.

John Walker Moore: Dr. Horine has fully covered the question of quinidine therapy in cases of auricular fibrillation. As he has stated, there are certain cases in which we should be very careful about administering quinidine. We have tried this remedy at the city hospital in various types of cases with no unfavorable effects other than attacks of ventricular tachycardia. Whenever the pulse begins to increase rapidly I think it is time to discontinue the administration of quinidine.

Dr. Morrison's case was undoubtedly one in which quinidine was indicated.

J. Rowan Morrison, (in closing): I appreciate the discussion. My reason for reporting the case was to illustrate the marked effect obtained by the administration of quinidine in this case. Normal cardiac rhythm was rather quickly restored under this type of medication. No digitalis was given at any time.

As to the use of quinidine in general: I quite agree with Dr. Horine and Dr. Moore that this drug should not be given indiscriminately in cardiac irregularities. In properly selected cases quinidine seems to be a valuable remedy. In most cases, however, the effect has been temporary.

The question in my mind is whether in the case reported the man did not have paroxysmal fibrillation. In such cases normal rhythm is restored after a time whether anything is done or not. In cases of that type digitalis should not be given.

In some of the cases I have seen fibrillation has recurred sooner or later. However, this man has thus far had no further trouble, and I believe it was an excellent case for the administration of quinidine. The question has often arisen whether quinidine might not cause clots to be thrown into the auricle and produce embolism. Lewis says he has seen such cases. When normal rhythm was restored, when the auricle ceased to fibrillate, emboli appeared in the brain, lungs, etc. Whether the occurrence of normal rhythm had any influence in the production of clots and squeezing them out of the auricle I do not know.

Someone asked the question as to how quinidine acts: In the case reported the man had a circus movement of 500. Quinidine sulphate was originally administered because it is known that quinine is first a stimulant and then a sedative. By taking five grains of quinine at night during the early part of his illness this man could get a good night's rest. Many of the older authorities claim that cinchona preparations are a heart sedative. It is supposed that quinidine acts as a heart sedative and at the same time restores normal rhythm. The mechanism of its action does not seem to be well under-

stood. I recall one woman with a greatly enlarged heart for many years who remained comfortable under the administration of digitalis. Decompensation then occurred with marked irregularity. After the administration of thirty grains of quinidine normal rhythm was restored. After two or three days of normal rhythm a mouse entered her room which started trouble and fibrillation was again noted. Although she took forty grains of quinidine after that her normal rhythm did not return. However, she has improved since then. She had a circus movement of 390. Whether her circus movement would have declined if she had not taken quinidine I am unable to say.

ENDOCRINOPATHIES: A CLINICAL REPORT.*

By R. ALEXANDER BATE, Louisville.

According to current opinion this is an age remarkable for its diagnostic acumen and its cultural contrasts.

If an individual, prompted by conscious ability (manifested by a hand shake with the left hand) volunteers activity, at once a superiority complex is suspected.

If on the other hand an individual is seen to be of modest and retiring inclinations and shakes hands with you with the right hand, an inferiority complex is immediately set down.

Should neither complex obtain, but a smile illumine the countenance of the individual as he bows, he is assuredly a moron!

Likewise modern cultural attainment inhibits all repression of impulse, lest genius be restrained; for it is now believed that like the mighty waves of the ocean, if ego be pent up, it will burst its appetencial prison; sometimes in "boot leg" form, sometimes as female bandit.

Consequently, the law is now handling youth and the devil-possessing age, where formerly the abnegation of knighthood ruled the world.

Fortunately, in endocrinopathies the physician, like the guide in guessing the depth of the Nile, is still allowed the privilege of assertion, if not of reason, hence I desire to present for your consideration three cases, as uncertain as the Nile in their depth, yet as inviting to diagnostic acumen as the syndromes of the boot-legger or the knighthood complexes.

The first case to be reported, Margaret L. B., aged 2 1-2 years, was referred to my observation December 1927 by Dr. Katzman, of this city.

Examination disclosed proportional over-

weight and over-height, a slight abnormality about the eyes suggestive of strabismus. Strabismus was reported as occurring in an uncle and grandfather on the maternal side.

The child more or less constantly resorted to masturbation by crossing the legs and pressing the genitals against some object as the sofa, etc. On account of this, a surgeon had excised the clitoris; but no diminution of the act in the child had followed. This seems to be the usual subsequent history, hence it should be noted that the sensations in masturbation are not entirely dependent upon the clitoris, although it may be required to excite the organs.

The mammae and external genitals were relatively larger than normal yet scarcely of pathologic proportions.

The nanas were more or less constantly rubbed together, while a slight purring noise was emitted.

Sugar was present in the urine in large quantities, but a history of undue candy feeding was given.

The child displayed recognition of objects and obeyed directions when agreeable.

The mental aspect of the child was so modified by the symptom complex of sexual precocity as to render self-pollution the chief act of volition, yet the brain was distinctly susceptible of mental impressions.

A diagnosis was made of pineal dysfunction with incipient macro-genito-somia precoc, or hypopineal function; there was also some overlapping of pluriglandular symptoms.

A prognosis vastly better than in idiocy was given.

It was believed and stated even at this time that the pineal status was inherited and not of tumorous origin, which fact also entered into the prognosis.

Drs. Keith, Keith & Bell later kindly supplied me with the report of a radiograph previously made in which they stated:

"Films of the skull in both the right and left lateral positions, and in the anteroposterior position, show no evidence of any abnormality of the inner table itself. It is very smooth and the blood channels are very similar in appearance on the two sides. Nothing indicative of increased intracranial pressure is seen. The sella turcica is quite small, but within normal limits. The antero-posterior diameter of the skull is less than is usually the case. A skull of this type is usually associated with some disturbance of development about the coronal suture."

(Signed by Dr. Bell.)

Such cases are not unusual, and much important literature is extant, from which the

*Read before the Louisville Medico-Chirurgical Society.

following conclusions are adduced.

Pineal enucleation in the young has been generally observed to be followed by rapid growth of the sexual organs.

Conversely cystration has been observed to be followed by atrophy of the pineal gland. Similar to atrophy which occurs in any unused organ, as the eyes of fish in caves, and in the many rudimentary organs observable throughout nature where environment has altered a type.

Pineal pressure or tumors that obliterate the glands are associated with the sexual precocity similar to the changes following enucleation.

Now the astonishing third premise is, that feeding pineal substance also causes sexual overgrowth.

Hence: That pineal autacoids directly affect sexual growth is thus proven beyond a doubt. (Because both ablation and feeding are followed by sex-growth stimulation.)

That pineal chalones restrain sexual growth to normal development is likewise demonstrated. (Because enucleation is followed by overgrowth.)

Also that pineal hormones stimulate sex development is positively proven. (Because of overgrowth after feeding.)

Normally, one would judge, the chalone principle of reaction which is electro-chemical in its physiology, is actively dominant until puberty; and the hormone principle, on reaction, is actively dominant from thence to the menopause in the female; and until virility ceases in the male. A prostatic connection has not been observed by me if such has been reported, yet it would seem logical.

Like the ovary and the testicle the pineal gland may secrete an interstitial autacoid that constantly influences metabolism throughout life.

Experimenters have used the glands of animals and fowls of different ages on recipients of varying ages, that is, homologous sex-activity has not always intelligently directed the experiment nor determined the result; so varied opinions have been reported, which are more or less worthless. Obviously results will vary according as the gland used is in the period of chalone or hormone activity or dominance.

The excellent work of the capable physiologic chemist has stimulated original research in some, perhaps incapable, where the hypothesis dwindles merely to the observations of the much mixed report of the few facts observed by a quiddler.

Such reports will automatically eliminate themselves.

Chemical tests with known reagents are sometimes difficult, but autacoid tests upon

subjects of unknown autacoid activity require the highest form of deductive reasoning as well as acute perception of phenomena.

So, in reading inconclusive reports, as I once heard said by a dyspeptic preacher, who had taken the remarkable text of Joshua commanding the sun to stand still "When you read poetry have sense enough to know it."

The clinical subject under discussion, was at the age of normal chalone activity, but hormone results were observed; hence a pineal dysfunction is obvious.

Endocrinous function, when not mechanically nor environ-mentally disturbed, is usually of transmitted or inherited origin.

A certain hormone may become conspicuous in a particular generation because of a dominant endocrinous function or a prevailing dysfunction in the ancestral mate, such is believed the outcropping in this case of autacoid imbalance, because of the ancestral threshold phenomena.

Disturbances of fat metabolism occur in pineal dysfunction. Obesity is associated with hypopineal function. The child in the case before us was slightly obese; indicating the hypofunction: we have already seen the chalones or sex-restraining principles were diminished here, relatively at least, although sex precocity may show a hormone activity of the pineal when brain and body superiority of development are present.

Hence the fat metabolism must be due to an independent autacoid function which influences general metabolism and not to the sex autacoids.

Pineal hyperfunction, in the child, is associated with somatic overgrowth, this child was taller than her age-average.

In hyperfunction of the pineal there is an increase in the hair in its various distributions upon the body, this symptom was not present in the case in question.

In hyperfunction there is increased mental development and the gray matter of the brain increases. Hence the anteroposterior diameter of the head should be increased or normal at least—in this child it was below the normal Nordic type, and the significance of Dr. Bell's "coronal" remarks are now clear as to development, or lessened gray matter.

Therefore it appears this child has only a relative increase of hormones as compared to the actual diminution of chalones; but instead of an actual increase in hormones with superior development this function is seen to be below normal as manifested by the small skull and the lack of cerebration.

Premature sexual maturity we have seen occurs when the entire gland is ablated, hence this is not an essential result of hyperfunction but may be the unrestrained mor-

phosis of the genitalia. Precocious sexual maturity is the predominating symptom in this child, although it is clearly a case of hypo-pineal function with only a relatively increased hormone activity.

Mental deficiencies are associated with hypofunction—our case presents this symptom; thus again accentuating the fact that enalone deficiency has caused a relative but not a genuine hormone increase or hyperfunction.

Glycosuria has frequently been observed after injection of pineal substance; (the same has sometimes followed adrenalin injection.)

This subject had sugar in "four plus" quantities present in the urine.

It is believed the epiphyseal body may mechanically control the aqueduct of Sylvius. It is probable the ocular manifestations in all cases are of mechanical origin, and thus, as in this case, a peculiar hereditary setting may exist such as might not be recognizable by the x-ray.

Extracts of pineal substance are diuretic and galactagogue when administered internally; somewhat similar to posterior pituitary principle.

Polyuria was present but not marked in this case. The breasts in this child had not been manipulated but were enlarged.

The pineal gland has not proven essential to life, hence other glands may vicariously perform some of its functions.

The contractile power of the pregnant uterus is increased by its action and some other effects similar to those of the hypophyseal and the suprarenal autacoids have been observed.

In pineal dysfunction focal neighborhood, or midbrain, symptoms, such as palsies of the third, fourth and sixth cranial nerves together with diplopia and cerebellar symptoms may result in tumorous or pressure cases but were not present in this case.

One of the general metabolic effects of pineal principle is the arrest of senile decay; the wrinkling of age is associated with pineal atrophy.

The overlapping of pluriglandular dysfunction undoubtedly modifies the clinical picture in the case of this study.

In the hypothyroidism of infancy there is a deficiency both mental and somatic which quickly yields to thyroid medication. There was no body deficiency in this case, hence another point of differentiation. A small sella and hypogenitalism are classed as present in underfunction of the pituitary, but dwarfism characterizes these changes when associated with hypophyseal inactivity; hence this too may be eliminated in our case.

The teeth and bones in this child likewise

show no faulty calcium metabolism or parathyroid dysfunction.

The child's diet was modified to one free of excesses and easily oxidized. Granulated sugar was not stopped, but cooked sugar was discontinued. The altered polarization of the cooked sugar being the basis upon which the distinction is made.

Epiphyseal substance, thyroid substance, pancreas substance and posterior pituitary substance were exhibited.

The child soon discontinued all symptoms of sexual excitement and showed such improved cerebration as to stand in front of the fire and say "fire hot." The sugar disappeared from the urine at once and returned no more, neither has there been any repetition of the droning and hand rubbing.

I have not seen the child for some time, but the mother's report justifies the prognosis given, which was with the proviso that the subject be kept under observation—not a few times, but for years.

Case 2. Frances K. Congenital hypoadrenia in a child of nine years. This case was also referred by Dr. Katzman.

This case presents quite a marked contrast to case 1. This little girl is tall, narrow chested, reserved, asthmie in type. Eats and sleeps fairly well. Teeth normal in growth and symmetry. Rectal and vesical incontinence. Easily excited if crossed. Plays with toy dishes or the table knives and forks. Does not display any especial fondness for dolls or manifest any sex proclivity. A white line is left by finger marks on the skin. There was very little effort at using the powers of cerebration. Comprehension of simple directions was manifested. Some obedience, but fear of the next event would bring tears. Hypogenitalism, but no pigmentation exists. "Mongolian" can not be applied to this child in spite of the smile as the eyes open wide and appear quite intelligent, the head is nearly normal with no degree of bullet-shape.

Laboratory verifications of both of these cases reported were postponed on account of individual contraindications to the ordeal. Basal metabolism and blood pressure records and analyses are of greater aid in the doubtful or mild cases of adults when stigmata are absent.

The child is receiving the whole suprarenal substance and pineal substance also. There has been an increase in weight, in red blood cells and in mentality. The child now answers questions, draws some, plays more and seems less terror stricken, vesical continence is greatly improved.

Case 3. Is a seven year old congenital hypo-thyroid case, in a female. This child

was the second child of a healthy mother and father. A sister older, and a brother younger are mentally precocious. This child was the typical cretin. Dwarfism, broad flat head, coarse hair, large tongue, diminutive thyroid, slow pulse, constipated, exophthalmos, narrow lid slits, myxedematous skin, intelligence moronic in type, with the apathetic smile. This child has been under observation since birth. Upon thyroid, pineal and whole pituitary substance this child grew as much as four inches in one year. Her cerebration is equal to originating thought, to reasoning and to executing a purpose; or approximately full mental coordination.

This summer she put a green plum under her stocking, went to her father and said, "see here Daddy, let's go see the doctor."

She was refused by the public schools because she did not go up and down stairs with the promptitude of the other children of the kindergarten. But her progress has been from nil to a fair intelligence.

These three female children are prototypes of the hypo-functional states of the ductless glands which cause mental and physical arrest of development. A study of these types, and the therapeutic results of opotherapy, encourage increasing effort in a formerly hopeless field.

Syphilis is not known as a factor in any parent in the cases reported.

Hygienic, moral and dietetic conditions were excellent in all three families.

Other normal children exist in each family except the pineal case, which is still an only child. The cause therefore is believed to be strictly some gestational arrest of gland development due to maternal or paternal heredity, or the result of some neutrality in the germinal union of the generative cells.

I have no prophylactic measures to urge except race, age, temperament or diathetic similarities in the mating pair. Gross consanguinity has resulted in stigmata. I do believe the actual origin begins with the chromosome, and results in electro-chemically disturbed physiology.

In mongolism the bullet shaped head with its silken hair are quite different from the hypothyroidal brachycephalic head with coarse sparse hair; also normal thyroids have been found in the mongol. The x-ray does not disclose a lack of osseous development in the mongol as in the hypothyroid. In mongolism there is probably a varying pluriglandular dysfunction which as yet has proven intractable. A further dissection of the glandular causes remains for future enlightenment.

"Congenital idiocy is invariably associated with amentia, spasticity, paraplegia, mono-

plegia and disturbed reflexes without the individual stigmata of the hypofunction of the ductless glands."

The prognosis in idiocy is so different from that of glandular hypofunction that it scarcely seems justifiable for one physician to render an opinion of idiocy in a doubtful case.

As suggested by Dr. Llewellys Barker when discussing psychoneuroses, "physicians are students of the biology" of their patient.

"It is the task of the physicians to search for the cause of their inadequacies of response, and to apply remedies, that will (a) either restore responsivity to normal, or (b) lessen irresponsivity and mitigate the personal and social sufferings that result from it."

NASAL SINUS SYMPTOMS, ACTUAL AND CONTRIBUTORY CAUSES, AND SYMPTOMS.*

By WALTER BLEDSOE, M. D., F. A. C. S.,
Covington.

My ambition is to present this subject in such manner that it may be of some practical interest to the busy general practitioner; hence, all unnecessary technical descriptions and statistics will be omitted. Lengthy articles, complete with details and intelligently written, make most interesting reading provided one has the time and energy to devote to it.

I am probably not far amiss in supposing that the average physician who hears or reads the article is chiefly interested in differentiating between sinus involvement and other conditions due to general causes but having similar symptoms.

Reference herein to the many complications that can be traced to sinusitis may be of some real value at times. Anatomical description of the nasal accessory sinuses will be treated quite superficially; minute repetition of their size and arrangement is considered superfluous, and simply naming them will be sufficient to refresh your memory I am sure.

On either side of the nose we have from before backward the frontal sinus which is usually a relatively large cavity in the bone of the brow just above the eye and bridge of the nose, with a funnel-shaped canal leading into the middle meatus in the nose. Back of the frontal is the anterior ethmoid which is composed of from four to fourteen small bony cells. Next is the posterior ethmoid with its one to three cells, and most posterior is the sphenoid, a one cell sinus.

Below we have the large maxillary sinus or

*Read before the Kentucky State Medical Association, Richmond, September 10, 11, 12, 13, 1928.

antrum. The sphenoid and posterior ethmoid drain through their small openings into the superior meatus, and the anterior ethmoid, frontal and antrum into the middle meatus.

The symptoms of acute nasal sinusitis can best be considered by referring to each sinus individually.

These patients are usually quite ill, just recovering from influenza, acute purulent rhinitis or some general intoxication and still confined to bed or may have been up for a day or two.

In acute frontal sinusitis the pain is unilateral usually, though both sinuses may give trouble at the same time. It is a severe more or less constant aching or throbbing, and located in the bone just above the eye, particularly close to the base of the nose, and radiates over the forehead and temple. It is made worse by bending the head forward or turning it suddenly. Commonly the pain has one peculiar characteristic which has not only been repeatedly observed in others but experienced personally by the writer more than once, and that is the daily periodicity with which the paroxysms of the most severe pain occur without any apparent possible explanation. It will appear at the same time each morning in a given case, last a certain number of hours, and gradually subside.

During the aggravated stage the entire head hurts, but pain is most marked in the frontal sinus region. Frequently sneezing or blowing of the nose, and the alternately closed nasal chambers, only serve to increase the discomfort. Pressure or tapping with the finger tip over the frontal sinus is very painful.

Each day the character of the discharge varies many times, from a profuse, thin, catarrhal excretion to an abundant thick, heavy pus. In either acute or chronic cases the odor may be very foul. Between times the nose may feel dry and parched, and the passage of air through it causes a distinct burning sensation. The alae of the nose and the upper lip are very much irritated by the acrid discharge. Depression and weakness are pronounced and due to the pain and toxemia. The sense of taste and smell may be diminished or absent. The eyes are weak and very sensitive to light.

In chronic frontal sinusitis the pain is more of a dull aching, but is constantly annoying, and usually pus can be found by shrinking the nasal mucosa under the anterior tip of the middle turbinate.

The symptoms in acute ethmoiditis are very similar to those of frontal sinusitis, except that the pain is complained of more deeply in the head between and behind the eyes. Tapping on the frontal sinus is not painful, but deep pressure backward with the

finger tip placed at the upper inner angle of the orbital cavity increases the suffering temporarily. The pain radiates to the eyes, temples, parietal and sometimes to the occipital region.

In acute sphenoiditis there is more of a diffuse pressure in the back of the head and sometimes complained of in the region of the mastoid or just back of it. At times it is sickening in character. Not infrequently dizziness is a prominent symptom.

In acute maxillary sinusitis the pain may be in the cheek, upper jaw, teeth, eye or nose and is of an intense aching character, and deep pressure on the cheek intensifies the pain. Foul odor and often foul discharge from the nose are complained of, both in acute and chronic cases.

In the chronic form the pain is not so severe but constant and aggravating. In some cases it is practically absent.

Chronic sinusitis often escapes notice for long periods and probably many cases are never recognized, or found only when trying to explain some of the many complications with which we have reason to believe sinusitis may be associated.

Ordinarily a more or less constant, low-grade, annoying but not severe pain localized in one particular region, with periodic discharge of moderate amount, especially if it has a foul odor, should cause one to study the case carefully from every angle. Dropping of mucus in the throat is a very suggestive symptom.

It may be well to refer here to a class of cases where severe, painful manifestations are present and due to a vacuum in any of the sinuses. The pain is violent at times and localized more or less, the painful area depending upon which sinus is at fault. These cases are commonly, but not always by any means, free from a general acute rhinitis. Usually upon intranasal examination a localized swelling or polypoid mass is found which blocks the natural orifice to the offending sinus, and prevents the normal ventilation of it. This is followed by the absorption of the contained air by the blood producing a vacuum within the sinus. Following this release of pressure, as it were, there occurs a marked engorgement of the blood vessels in the mucosa of the sinus with more or less edema and its consequent stretching and pressure on the sensitive nerves therein. These are the cases where temporary magical results are obtained by the local application of adrenalin or ephedrin, a combination of the two being preferable as the effect of adrenalin is more rapid but not so lasting as ephedrin.

Actual causes: Infection of one or all of the sinuses may occur in a given case, and is

found to be due to one or more, usually several, of the following organisms, namely: the influenza bacillus, micrococcus catarrhalis, pneumococcus, staphylococcus, pyocyanus and meningococcus, and are found in such diseases as influenza, acute rhinitis or common colds, scarlet fever, pneumonia, diphtheria, measles, smallpox, typhoid fever and tuberculosis. Their entrance into the sinus is made possible by an extension of the inflammation from the nasal mucosa through continuity of mucous membrane, or—and this I believe to be by far the more common way—is by the improper and too forceful method of blowing the nose.

Contributory causes: A patient suffering from acute sinus disease, if carefully interrogated, will almost invariably give a history of violent blowing of the nose more than once a few days prior to the onset of the symptoms.

At this point permit me to do some still much needed missionary work by laying considerable stress upon the proper method of procedure in blowing the nose. I have referred to this feature many times before, but it will bear repetition. Admittedly it is a difficult problem to teach old dogs new tricks. However, you gentlemen who are in daily contact with patients and others in private homes can have the greatest influence in minimizing the tendency to sinusitis by teaching the younger generation how to properly blow the nose.

The handkerchief is held so as to cover the nose loosely, and neither wing or alae pressed upon. Both nostrils should remain open, and a reasonable amount of air suddenly expelled through the nose. When one nostril is pressed upon by the finger and much force is used in blowing, if the open nasal chamber is not large enough to permit of ready escape of air, pressure is then exerted in all directions equally, forcing not only air but excretions into the sinuses on each side, also a backward pressure into the ears.

Clearing the nose, except in the handkerchief, is profoundly disgusting and extremely unsanitary. Please remember the normal nose never requires clearing or blowing.

If the result after blowing the nose is unsatisfactory, in that stuffiness or fullness has not been relieved, it is invariably due to either a temporary or permanent narrowness of the nasal chamber caused by a boggy swelling of the mucosa covering the turbinates with or without a pre-existing deflected septum or septal spur. The latter conditions in varying degrees of severity are so common that each of you meet many persons, professionally or otherwise, so afflicted every day

in the year. Such persons particularly must exercise reasonable common sense in blowing the nose if they wish to avoid the pleasures(?) associated with sinusitis.

Chronic hypertrophic rhinitis and polyps play their part as contributory causes in that they perpetuate a chronic hyperemia in the sinuses, and they may, depending upon their size and location, so obstruct the ostia or opening of a sinus as to interfere with its ventilation and drainage to a greater or lesser extent.

Irritating gases, as from ammonia, acids, smoke or dust of whatever sort, or excessively dry air, predispose the nasal mucosa to infections and possible sinusitis.

Complications which involve the brain or its covering membranes during the course of an acute or chronic sinusitis are comparatively rare when the number of cases are considered. But, that they do occur and usually when least expected, and the extreme seriousness of the case when these manifestations do develop, should be sufficient forewarning to keep this important possibility foremost in our minds. Meningitis or brain abscess is explained by the infection being carried by the blood or lymph stream directly to the meninges or brain substance proper, or by erosion of the bone covering the sinus, and direct extension.

Orbital cellulitis or abscess may complicate acute or chronic sinusitis by erosion of the thin bony wall separating these cavities, or by the blood or lymph stream, and the optic nerve may be so stretched or pressed upon as to cause partial or complete blindness. On account of its close proximity to the wide wall of the sphenoidal sinus, the optic nerve sheath may become acutely involved producing a retrobulbar optic neuritis with ultimate partial or complete loss of sight.

Iritis, retinitis or uveitis may appear at any stage. Possibly the more common complications affecting the eye to be mentioned are purulent conjunctivitis and corneal ulcer which follow the indiscreet mopping or rubbing of the eyes with fingers or handkerchief contaminated by the purulent excretions from the nose.

Acute otitis media not infrequently has its beginning during an attack of sinusitis and due to too forceful clearing of the nose.

Secondary infection of the thoracic cavity may follow the direct extension of the infection through the lymphatic system.

Bronchitis is frequent and pneumonia not rare. Acute endocarditis, pericarditis and even myocarditis are not infrequently associated with acute or chronic sinusitis.

Nephritis and pyelitis may develop and the

careful observer will occasionally avoid embarrassment by frequent urinalyses.

Gastric and duodenal ulcer, appendicitis and cholecystitis have been reported in connection with sinus pathology.

Violent acute arthritis, chronic arthritis (arthritis deformans) and neuritis are comparatively frequent complications.

The portrayal of so many possible complications is truly sufficient to startle one, but fortunately the frequency with which they occur is very small when compared with the large number of cases of sinusitis observed. However, it behooves one to be ever alert and mindful of the fact that "they may slip in" any time unannounced as it were.

The writer cannot fully satisfy himself that the complications can always be positively and solely attributed to the sinusitis. Often this would be "splitting hairs." He takes the view that sinusitis in itself is always a secondary infection and believes that oftentimes the complications are rightfully attributable to the nasal infection.

In conclusion, patients suffering from arthritis, neuritis, iritis, certain nephritic and cardiac manifestations are entitled to the most profound study and research, and many will tax the patience of not only the observer but the observed. One must view the case broadly, remembering that while a focus of infection is frequently found in one or more of the sinuses, that other areas of equal importance are the teeth, tonsils, intestinal tract, gall bladder, and last but by no means least is the character and quantity of food and fluid intake.

DISCUSSION.

W. B. McClure, Lexington: I have about five minutes before leaving for home and I can't resist the temptation of saying just a few words about Dr. Bledsoe's excellent paper.

Dr. Bledsoe's statement that the nose is not an organ to be blown is a fact which reminds me of a conversation heard in the Golden Square Hospital in London when Dr. Bond, in trying to get at a diagnosis, said to an English lady from the northern part of the country, where I believe they have a little more temper than the others, "Madam, do you use a handkerchief?"

She shrugged her shoulders and said, "Of course, Dr. Bond, every lady uses a handkerchief."

Did it ever occur to you that Eve didn't have any handkerchief to use?

It made a profound impression. The very fact that we use a handkerchief or that we use a cuspidor is evidence in itself of disease.

Dr. Bledsoe attempted to explain to you how to blow the nose. I disagree with him. The proper way in my judgment to blow the nose, if it has to be blown, is for the patient to step

into the back yard, put the hands down by the side without a handkerchief, and expel air through the nose and then use the handkerchief. That is a safe, wholesome way to blow the nose and you don't do any harm. There are no inflammations of the sinus or the middle ear or any complications like that.

I agree with the essayist that entirely too many surgical operations are done in sinus involvements. I believe there are very few cases of acute sinusitis that require an operation. I believe that by shrinking, promoting drainage, at least ninety per cent of the acute cases of sinusitis may be gotten by. Of course there are those old chronic recurring cases that I believe frequently have to be operated. The question of shrinking the tissues, promoting drainage, hot packs, if necessary, over the region involved, will work wonders, and I believe in that way we can get by a great many of the unnecessary sinus operations.

A. L. Bass, Louisville: I am sorry there are not more here to enjoy Dr. Bledsoe's paper and the ground he has covered, and so thoroughly. I will try to confine my remarks relative to the general practitioner.

First I want to review the location of pain referable to sinus infection, so as to make it emphatic and so as to help out these poor patients. From frontal sinus the pain is over the eye, and throbbing in character. If it is chronic it is more continuous and dull. In ethmoid pain, sense of pressure at the root of the nose radiating to the parietal region. If it is the sphenoid, you get occipital pain radiating to the mastoid and the root of the nose.

If it is from the antrum, acute, it is in the cheek and over the eye. If it is chronic, it is not as a rule in the cheek but more so over the eye; there being nothing but the antrum involved the pain will be over the eye and no other symptom complained of except lassitude or rundown.

Referring to sinus infections in children which we have to contend with a lot, and following acute colds, you take these children when they first get their acute colds. Enough has been said about blowing the nose, and there isn't any use to touch upon that, except to carry out the instructions that you have had told to you.

Clean out the intestinal tract, alkalinize them, use a little neosilvol or argyrol fifteen to twenty per cent solution, add enough ephedrine HCl to make it three per cent and drop it in the nose twice a day. If it doesn't go through at first let them hold the head back and wait a few moments, that will relieve the congestion. The effect will last from three to six hours.

Instead of letting children get into further trouble, you will relieve them.

You don't necessarily always have pain in

sinusitis in children. For instance, coming close to home, my youngster ten years old who has had his tonsils and adenoids removed well because I did it myself, has been away to summer camp. He came back the other day and said he was in the infirmary up there for two or three days on account of a cold.

I said, "Did you have any pain?" He said he had no pain, but a cold, a little fever, and the doctor turned him back to his morning cold shower and the regular routine they have in camp.

He was talking through his nose and breathing very little through it, and I took him to the office and found the creamy pus which is characteristic of sinus infection of some standing, transillumination showed the right antrum dark, the rest of them clear.

The x-ray showed his right very dark and the left one slightly. I washed out his right antrum after I had treated him a time or two, with suction, and got plenty of pus. Then I washed out his other, and I washed it out twice, and about three or four irrigations every other day for his left one cleared him up. That was plenty. Don't do that to start with when you have acute sinus infection. I feel if I had gotten him when he first started out, by shrinking him up and a little local treatment he would not have had the antrum involvement.

Another thing that is noticeable, is infections that we are having to contend with from swimming pools. As I told one of the doctors the other day, during the summer months, I can very nearly pay my office expenses from the conditions that we get from swimming pools, furunculosis of the external auditory canal and sinus infections. Just what we are going to do about it I don't know. I think we have one of the best water systems in the country in Louisville and keep it well chlorinated. It is just these people who get in the pool, turn loose the excreta, and expectorate and blow the nose; while it may not be so virulent to them, being so well built up themselves, that same "bug" may be very virulent to the next individual who comes in contact with it.

One youngster just got well from furunculosis the other day after about a week's treatment. He came in the office Monday with an acute middle ear. He has had his tonsils and adenoids removed. Just what we are going to do to keep these people from getting into trouble I don't know.

R. W. Bledsoe, (in closing): I very much appreciate the gentleness with which you folks have accepted my paper. If I have been able to make any suggestions that will be of value to you in your work I shall be highly repaid for the effort.

Dr. Bass asked me to speak of the diet in these cases. I hesitate to refer to this sub-

ject, in spite of my inclination to do so, as the treatment of these conditions is not covered by the title of my paper. I hope to be able, at some time in the near future, to present a paper on the dietetic management of these and similar cases.

In regard to Dr. McClure's remarks, I can not let Dr. McClure's serious objection go unchallenged. I contend that my method is right, although I will admit that his method is safe, but still unsanitary. Speaking seriously, whatever Dr. McClure says I will "back him up"—that shows where he stands in my estimation.

Dr. McClure suggested that there were too many intranasal operations. I heartily agree. There has been in the past and still is, entirely too much intranasal surgery, particularly in acute cases; just as Dr. McClure says, the vast majority of these acute cases indicate surgery and we are often tempted to do more than we should. The proper thing to do is to relieve the congestion temporarily by treatment and encourage drainage and ventilation. Nature can cure them better without surgery if sufficient and proper ventilation and drainage is afforded the patient.

Old long-standing chronic cases of course should be operated when they cannot be permanently relieved by ventilation and drainage.

I might add that in those cases who are quite ill and blowing the nose, as a rule my suggestions to them are to cease the use of a handkerchief in blowing the nose even moderately, and to draw the secretions back into the throat and expectorate them. One may think there is danger of infecting the ear through the eustachian tube this way. There is not nearly so much danger in siphoning, as it were, the secretions back into the throat and expectorating them as there is by the use of excessive air pressure to get rid of them through the front part of the nose. It is a hard matter for any of us when sick or well to estimate how hard to blow the nose when there is a varying amount of swelling in either side. The force used at one hour may be too severe for an hour following, depending upon the swelling that has taken place in the nose.

As I said in my paper, the swelling varies from hour to hour.

In regard to Dr. Bass' suggestion in the line of treatment, I agree with him heartily. I also agree with him that in children it is frequent that we have no complaint of pain whatsoever. Commonly the symptoms there complained of are those to which I referred yesterday, namely, malaise, rise of temperature, loss of weight, and loss of appetite, with the dropping of secretions in the throat.

A REVIEW AND SUGGESTIONS ON THE PREVENTION AND TREATMENT OF TUBERCULOSIS.*

By GEORGE PURDY, M. D., New Liberty.

In reviewing the question of prevention and treatment of tuberculosis it will not be my intention to go into detailed reports or statistics but rather to consider the question from a general point of view.

The question of prevention and treatment of tuberculosis is of so much importance that, it seems to me, there need be no apology made for introducing the subject here. It should be constantly reviewed by medical men in convention, and not only by the medical profession but by economists in all professions and in all lines of industry and in Governmental parlance. It is a question that influences all life, both physical and economic.

There seems to be a tendency to rest on our laurels in the fight against this disease and to devote our efforts toward more interesting and uncertain things. It is true that much effort has been made and much money has been spent, especially in the erection and maintenance of tuberculosis hospitals, but when we consider the enormous proportion of the question, not alone from its effect on life but its cost in dollars and cents and waste of time, we cannot but wonder why we do not become more active in this campaign. We cannot but wonder why people who are informed concerning this question do not manifest it by increasing and redoubling their efforts. We cannot but wonder why legislatures do not increase rather than decrease appropriations to help cope with it.

The American public has never fully realized the extent and scope of tuberculosis. It seems that there is always a tendency to consider it as a matter of course and, especially since it has once been stated that this disease is on the decline, there is a tendency to think that it will soon be eradicated and many have ceased to lend the cause their immediate sympathy. We hear much today about venereal disease, cancer, and goiter, but the dread of and the discussion of tuberculosis is not so great as it was a few years ago. I dare say that the question is becoming stale in the councils of medical men. It takes more than the discovery of the specific organism of tuberculosis and more than the statement that rest, pure air and proper food will give relief to eradicate this disease. I know of no disease fraught with more danger and with

more significance to human life concerning which there is greater ignorance and superstition. It is an ever present question and will not cease to be of vital and economic interest during this generation and the generation to come.

The eradication of this disease primarily, as is the case in all disease, depends upon the men who are interested in medical science. Through their initiative and knowledge and the philanthropy of individual and state must come the dissemination of the power that will conquer this disease. I call it philanthropy, but is it? When we consider the struggle incident to human existence we must come to the conclusion that the effort to stamp out such a ravaging scourge is not philanthropy but rather a selfish motive induced by the desire for self preservation and an enjoyment of an assurance that posterity may realize our ambitions. Why cannot all rally to the banner and fight with a well disciplined force? What will our posterity think when it realizes that it has been left a heritage undesirable, that should have gone down in defeat a generation before? We have the knowledge, and knowledge is power, to do the thing but we are sluggish, our efforts are comparatively feeble, and while we may be making some progress pray tell me when, at this rate, will the task be complete.

We have the knowledge but there are many things yet to learn. We are reasonably certain that we know the specific organism, but we do not fully understand its relation to many of its accompanying organisms, the influence of one upon the other. The mode of entrance into the body is a mooted question. One claims that it engrafts itself upon the lung tissue direct being carried by air medium, while another has found evidence that it gains entrance through the gastrointestinal tract and still another claims that it gains entrance through the gastro-intestinal tract during childhood, lies dormant until such a time that the resistive power of the body is reduced and then becomes active. Bearing on this point is the generally accepted fact that primary tuberculosis in other portions of the body than the lungs is rare. Some investigators tell us that this happens at a rate of only two per cent. If this be true primary tuberculosis in other tissues than the lungs may be questioned. We are told that autopsy proves that nearly every one sooner or later is afflicted with tuberculosis. These figures vary from sixty-five to ninety-five per cent. How relief from this frequent infection is secured we do not fully understand. The disparity in these figures is too great for scientific reckoning. These are questions that the medical profession must, of a necessity, set-

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tle. And until they, and many others, are settled we are handicapped in the preventive treatment. Scientific research in tuberculosis is in its infancy.

I would suggest that conducive to the preventive treatment of this disease periodic physical examinations are very necessary and not only to the age of thirty-one, as has been suggested by one in the public eye, but throughout life. I believe that the campaign for publicity should be continued and increased. Through this means alone can the question be kept before the public, and without antituberculosis propaganda we can do little. The real prevention of this disease will only come through the proper education of the public mind. An educational campaign, so extensive and so persistent, to reach every person is necessary. This campaign should see to it that the true knowledge of the prevention of this disease is disseminated in every home and in every school and that every person is forced to keep it before his mind until he has acquired sufficient knowledge to protect himself and those dependent upon him from this plague. We hear much of the prohibition of alcoholics today, but hear little of the prohibition of coughing and expectorating in public places. Of the two, perhaps, the latter is more grievous and a greater menace to society. Especially in rural sections, legal requirement pertaining to ventilation is unknown. We agree that pure air is an essential to good health but the general public is not aware of our agreement. They must learn it in the interest of themselves and also they must learn it in the interest of the body-politic.

I wish to go on record as one who is wholeheartedly in sympathy with all efforts of the present day that are directed combatively against tuberculosis. I do not know of any other organizations that deserve more commendation. Reverse and slow progress is not to be laid at their door. Their efforts are handicapped by a misunderstanding and an unsympathetic public. The medical profession as a whole must labor with them to overcome the handicap.

Today it is not claimed that there is a specific cure for this disease. Many such claims have been made in the past. Many times has a hopeful public been aroused by some statement purporting the cure, but all have failed. Until such a time when medical science has produced or discovered the specific we are forced to resort to general measures which experience has taught us are most conducive to the recovery of the patient. It is gratifying to know that, although no specific treatment is known, the fight against tuberculosis is a

winning fight and while it is slow in progress, yet, progress is being made.

Experience has taught us that the best one thing that can be done for a tuberculous patient is to place his body and mind at absolute rest, or as near that as is possible. This idea cannot be compromised. Rest in the treatment of tuberculosis means all that the word implies—twenty-four hours a day, all the time, and it must be continued long after the temperature has returned to normal. I am persuaded that the value of rest in the treatment of tuberculosis is not universally appreciated and that this most helpful agent is not absolutely applied and is not applied for a sufficient length of time. How many of us can reflect upon errors of this kind. The desire and insistence of the patient and the failure of the sympathetic support of the family are prone to interfere, either in institutional or home treatment, especially the latter. It takes a master mind, backed by the attribute of strong determination, sufficient to overcome all difficulties to cope with the successful treatment of tuberculosis. It is not sufficient to tell a patient that it is imperative that he rest in bed until long after his fever has subsided and that his exercise must be carefully guarded and graduated. If we expect hearty cooperation the patient will, of a necessity, have to know why he must rest. Then, again, it is not so easy to obtain this rest. In many cases it is impossible. How can one reasonably expect a tuberculous father or a tuberculous mother, who is encumbered with the responsibility of fatherhood or motherhood to do this. And, while this is before us, how can a respectable government, state or county fail to provide the necessary physical possibility for its unfortunate citizens, who have no other resource, in order that they may continue to have life? It is not a little thing when we realize that this state is expending millions of dollars on roads and millions of dollars on schools and hundreds of thousands on other things and at the same time letting this scathing lethiferous plague sap the manhood and womanhood of our fair commonwealth without an honest effort to furnish the means of prevention and relief. In the large majority of the counties in Kentucky there is absolutely no recourse for the indigent tuberculous patient, white or black, except to attempt home treatment under impossible conditions. The minds of Kentucky people are open, their hearts are sympathetic but they are ignorant of the urgent necessity. The lust of politician and the greed of corporation, because of this ignorance and its resulting apathy, have diverted

the fundamental economics of government into other channels.

Next to rest in importance in the treatment of tuberculosis is the application of open (pure) air. Fortunately, especially for rural patients, this is the most abundant thing available, and yet many who are ignorant of its helpful qualities deprive themselves of it. Tuberculous patients who are capable of understanding should be taught and those who are not should be forced to take this advantage. In the application of this agent we should, as in the case of rest, apply it continuously—twenty-four hours a day. In my opinion the air in which a tuberculous patient lives should be pure and comfortable. The question of the temperature of the air is one that has been much discussed. From my experience and observation I believe that, with the exception of certain conditions relative to cough and certain graduated changes similar to graduated exercise as the patient goes on to recovery, an ordinary room temperature is most to be desired. This is the natural habitat of man and is most conducive to comfort both physically and psychologically. A man physically or psychologically uncomfortable cannot be at perfect rest which is the greatest aid to the recovery of tuberculosis known today. It is needless to say that chill to the surface of the body or exposure to sudden changes of temperature should be forbidden.

Food is a necessity to all life. In the treatment of tuberculosis, which is a febrile disease and consequently a wasting disease, food ranks third in importance as a therapeutic measure. If we expect the body to keep up its normal metabolic function we will necessarily be compelled to administer, not only the necessary fuel to carry on this metabolism, but will be compelled to add a sufficient amount to take care of the wasted material caused by the febrile condition. Theoretically then, the higher the fever the greater the waste and consequently the greater the intake requirement. This statement is made with the full realization that theory alone will not suffice to lead us to victory and that practice must also have its chance. But in the main this statement is true. It is axiomatic that if the patient uses, from whatever cause, more food than he receives he is destined to but one end. The amount of food in tuberculosis, as in health, must be regulated according to body requirements, weight being the chief factor. The art of securing the hyperalimentation necessary in this disease is one that does not call alone upon the physician but demands a proper degree of knowledge on the part of the dietitian or, in home treatment, the per-

son in charge. It is necessary to maintain the proper balance in foods according to the condition and the stage of the disease in order to maintain the proper balance in the patient. Say, for example, a man weighing one hundred and fifty pounds requires twenty-four hundred calories at rest, with a high temperature he requires five thousand calories. McCann, of Bellevue Hospital, sets the average at between twenty-five hundred and three thousand calories. The nitrogenous balance in a tuberculous patient is the most important. That a high carbohydrate balance seems to assist in keeping up the nitrogenous balance is the opinion of McCann. The general consensus of opinion is that, in regard to feedings, plus the three meals a day, in the middle of the morning, in the middle of the afternoon and at bed time additional food should be given, food easily digested, caloric high and protein high. Clendenning quotes an interesting phrase touching on this thought, "Appetite is a luxury not a necessity."

In the consideration of the effect of climate on tuberculosis we find that most patients esteem it of great importance while, in fact, it has very little influence. In the past tuberculous patients have flocked to some of the high altitude states and died or became burdens on the states to the extent that some of the cities in these states advertised that patients unprepared financially should not come. Statistics are causing physicians today to place rest, air and food all before climate in the treatment of tuberculosis. Clendenning states in his book on "Modern Methods of Treatment", that New Mexico has only 1% advantage in institutional treatment over eastern institutional treatment in incipient cases with more for moderately advanced and far advanced cases. While a difference of one or two per cent is of importance it is often off-set by other conditions. We are under the obligation as physicians to disabuse the minds of our patients concerning the fallacious belief that climate is a panacea for this disease.

The question of tuberculin treatment is an open question. The fact that we have so many kinds of tuberculin, all of which have their ardent advocates, is in itself disconcerting. The advocates of the use of tuberculin claim that its action on exposed parts is favorable, that it causes a more rapid disappearance of bacilli from the sputum and that tuberculin treated cases remain healed longer than those not so treated. The general knowledge among physicians of the technic in the use of tuberculin treatment is limited. I recommend that the use of tuberculin in cases slightly advanced and cases that are improving is advantageous, with the reminder

that a decided harmful action is possible. This possibility I do not attempt to explain.

It appears to me that in the treatment of late cases artificial pneumothorax is not used to as great a degree as it should be. This belief is based on the belief that much good results from natural pneumothorax. It is nature's way to relief, then why not follow the example of nature? It is useless to say that it should be used late, when the disease is confined to one side and when no pleural adhesions are present.

I need not discuss the question of drugs except to say that they occupy, so far, the least important place in the minds of the general run of tuberculous patients. Creosote does more good than any other drug. It improves the appetite, deodorizes the sputum and improves nutrition. It is also our best adjunct in decreasing cough. In hemorrhage, if treatment is indicated at all, morphine and the ice bag and, if severe, fibrogen offer most. Too much medication is worse than none at all.

DISCUSSION

K. S. McBee, Owenton: I want to commend Dr. Purdy's paper. I certainly commend everything he has said. We have been very lax in looking after tuberculosis in the past ten years, especially since the war. We have done very little work in pushing the progress of the prevention of tuberculosis in Kentucky during that time. We are handicapped especially by poverty on the part of our state officials. Until we can get our senators and representatives to see the seriousness of this disease and give us greater appropriations for hospitals and all-time health officers, we are never going to get very far with the cure of this disease. There is one thing that will help us more than anything else, the all-time health officer who will take this matter up in the schools and teach it as it should be in every school in the rural district. General practitioners have not time to do this. We need the all-time health officer to make these lectures to the primary grades. It is useless to wait for the graduating class. The older they are the harder they are to teach.

If we don't get more appropriation for our hospitals, we will never get very far with our new and latest treatment, pneumothorax, which I feel is giving great results in a great many more cases than we felt five years ago. These cases require a long time under special care and attention. Fifty per cent of the tubercular patients are without funds. We see how few can avail themselves of this treatment. Until we can awaken ourselves to the point of stimulating a greater interest among our legislators and get greater appropriations, we will not get the relief we want in tuberculosis.

CHRONIC INTERMITTENT PURPURA: REPORT OF CASE.*

By ARMAND E. COHEN, B. S., M. D.,
Louisville.

The object of the writer in presenting this paper is threefold: first to place on record the history of a rather interesting case of chronic purpura, second to review briefly the classifications and the modern treatment of the purpuras, and third, to hope that interest may be stimulated and mutual benefit derived from the discussion of similar cases that may have occurred in the practices of the members of this society.

Case Report: April 14th, 1927, Mrs. L. S., a white woman, aged 47, complained of weakness, malaise, and a purpuric discoloration of her lower extremities. One week previous, the patient had gone to bed feeling well, but awoke about midnight feeling quite warm and markedly nauseated. She noted carefully the onset and progress of her symptoms. After the first general feeling of warmth and nausea, she suffered a severe emesis with considerable retching. The vomitus was a clear yellow fluid and was not blood tinged. There was then felt a pricking sensation in the lower extremities from the hips to the feet. The skin over these areas became spotted with small hemorrhagic areas varying in size from a pin point to large diffuse areas the size of her hand. The diffuse areas began as delicate pink discolorations and grew a deeper and deeper red. Following this, the patient lost consciousness and was not revived for several minutes. She was then quite exhausted and was content to lie in bed. Her pulse was rapid 120, and her temperature was 101°F.

The pyrexia gradually subsided following several days rest in bed. The fifth day following this acute exacerbation the temperature was normal and the purpura began to fade, gradually changing from a red to a green and blue, then to a copper color. The sixth day she was able to walk about. She noted some desquamation over the purpuric area.

In 1917 ten years prior to this present illness the patient had noted purpuric spots about the size of a dollar on her right knee and wrist. At that time her physician assured her that they were of little consequence, so when she noted an occasional return of these spots, little attention was paid to them. In June 1913, because of a gradually enlarging adenoma of the thyroid, a thyroidectomy was done although at that time no toxic symptoms nor increased meta-

*Read before the Jefferson County Medical Society.

bolism had resulted. The patient made an uneventful recovery from this operation and was feeling in excellent health when she suffered her first acute attack of purpura. This exacerbation occurred six months after the thyroid operation, and was characterized by symptoms quite similar to that already described in the present illness. Thereafter there were recurrences at intervals of six months, so regularly, that patient was able to approximate in date of her next catastrophe. During the interval of these attacks the patient would be in good health although occasionally she would note a large purpuric spot either on the thigh or more usually under each arm. The patient's menopause had begun in 1925, and she had last menstruated August, 1926. She had two grown children who were quite healthy. There was no history of any venereal diseases, miscarriages, nor still births. The family history was one of longevity and there was no family history of hemophilia, purpura, nor other blood dyscrasias. The patient had always enjoyed good health having suffered no post childhood diseases except for the purpura mentioned. On physical examination the patient appeared well developed and nourished, her height being 65 inches, and her weight 170 pounds, her temperature 98°F., and blood pressure 130-76. There was no enlargement of the spleen nor liver and aside from the purpura to be described the examination was practically negative. On both thighs and legs, and to a lesser extent over the abdomen were brownish pigmented areas varying in size from a pin head to a dollar, and purpuric spots some of which resembled the dark greenish color observed at times following a bruise. Some areas still showed a faint pink color while others had begun to desquamate.

The laboratory findings showed a normal urine. The blood examination showed Hg. 75%, R. B. C. 3,200,000, W. B. C. 7,200, the white cells stained by the Gram method were in normal proportions and the blood platelets were apparently normal (300,000). The bleeding time was 45 seconds and the clotting time 4 minutes. There was a normal retraction of the blood clot. The blood sugar and blood calcium were in normal proportions and the blood Wassermann was negative. To test for protein hypersensitiveness over one hundred foods, emanants, and bacterium were tested by the scratch method. Of these Tunafish and B. Coli gave positive reactions. The gall bladder drainage by the Lyons method showed A B and C bile present in the normal proportions and cultures did not show any growth. The basal metabolic rate was 5.

Because the patient's acute purpura had

occurred so soon after the thyroidectomy it was thought possible that there was some thyroid or parathyroid disturbance and the patient was given tablets each containing desiccated thyroid 1-2 grain, dessicated parathyroid 1-20th grain and calcium lactate 5 grains, to be taken three times a day. This treatment, however, did not prevent the occurrence of another acute exacerbation of the purpura which she suffered September 7, 1927. This differed from the previous conditions only in that it consisted of two phases, the greater part of the purpura showing itself Sept. 7, and a lesser hemorrhage was suffered three days later. Following the patient's convalescence it was thought practical to try a vaccine therapy. Since this patient had shown a positive skin test against B. Coli a stock vaccine of this organism was procured and doses beginning with 2 cc. and gradually increasing dose every other day until 1 cc. doses were being given. The patient received in all 30 injections. The larger doses produced some soreness over site of injection and a slight rise in temperature, otherwise no untoward symptoms were noted.

We do not know whether it is a coincidence or whether some credit can be given to the efficacy of the vaccine, but the patient has had neither purpuric spots nor an acute exacerbation of the purpura for more than a year. I am aware of the fact that purpuras of this type may reoccur even after periods of several years and by no means is this case pronounced as a cure. It is felt however that in view of the long remission of symptoms in this case following the use of colon vaccine, that it is a method that should be considered in the treatment of the non-thrombocytopenic group of chronic purpuras.

It might not be amiss by way of differential diagnosis and in order to justify the classification given the case just reported, to mention other types of purpura. The older classifications were almost purely symptomatic. The more modern classifications divided the purpuras into two large groups, first, the thrombocytopenic characterized by a paucity of blood platelets and spontaneous hemorrhages from the mucous membranes. Examples of this group are purpuras associated with infections, poisons, diseases of the hemopoietic organs, nutritive disturbances and senility. The second large group is the non-thrombocytopenic or idiopathic. These are associated with other exudative lesions, joint and visceral disturbances, and present no recognized pathology of the blood. Under this group may be considered hemophilia, cholemia, arthritic purpura, Henochs or purpura abdominalis, hypertensive vascular

states, congenital vulnerability of the capillaries, diseases of the nervous system such as blood sweating in hysteria, and evolutionary changes associated with the menopause. A third less clearly defined idiopathic form is known as purpura fulminans.

Minot and Lee, in their article in Nelson's Loose Leaf Medicine note, "That cases of idiopathic purpura may be extremely chronic, has been frequently noted, but not often emphasized. Any form of the disease may be chronic."

The chronic purpuras seem to be of two type, first, the continuous form, and second, the intermittent form. In the continuous form of the disease the patient presents symptoms of general debility, rheumatism, or of gastric or intestinal trouble which sometimes is associated with tuberculosis. Examination of these patients show ecchymoses or purpuric spots which have been present for years to which no importance has been attached because of their rapid disappearance. Epistaxis and gingival hemorrhage are common in these cases. This type is not characterized by the great accidents which characterize the free crises of purpura hemorrhagica.

In the intermittent form which appears to be more frequent the crises are separated by intervals of varying length and contrary to current opinion they may be accompanied by fever. The duration of these cases are extremely variable. The long periods of quiescence in the intermittent form of the disease, the almost complete absence of subjective complaints during the interval and the fact that most of the chronic purpuras are of this type are the reasons for the failure of many authors to recognize the existence of chronic purpura. Recurrences for more than twenty years have been observed. The intermediate periods may be for as long a period as 7, 8, and in one case 17 years. The mode of termination is likewise variable. Because of the long latent periods, it is never justifiable to conclude that the patient is cured, neither can one call the disease benign because the patient may die during a crisis. Elsner and Meader in the Amer. Journ. of Med. Sciences 1913, state that diagnosis of chronic purpura is aided by the fact that the majority of the observers agree that the blood clot does not contract, that the coagulation time is normal and that the blood platelets are usually decreased. The case which I have presented while certainly chronic and intermittent, yet does not show the recognized pathology of the thrombocytes, which evidently would be required by some observers before a diagnosis of chronic purpura might be made. This case might fit in the classification of a non-

thrombopenic purpura associated with menopausal changes, but it would be rather unusual to have noted purpura nearly ten years before the menopause. Henoch's or purpura abdominalis which is not infrequently chronic is differentiated I believe by the fact that this case had no typical abdominal cramps and absolutely no joint pains. While I should hesitate to add another type to the already cumbersome group of purpuras, yet for want of a better classification, I have considered this case under the general classification of non-thrombopenic purpuras and suggest the name "Chronic intermittent idiopathic purpura," as best suited as a descriptive classification of the case.

Regarding the treatment of the purpuras, modern additions include one or a combination of the following, blood transfusion, so-called protein shock which consists of the intramuscular administration of serum, whole blood, milk or coagulose; vaccine therapy, ultra violet ray, x-ray treatment of the spleen and splenectomy. While the protein shock method seems to be the method particularly recommended for the treatment of the chronic purpuras, mention is made in several texts of the use of vaccines, but I was unable to find any case reports in which a B. Coli vaccine was used. I am not prepared to say that the vaccine used in the treatment of this case was the cause of the long remission, now nearly fourteen months, or whether it was just a coincident in the course of the disease.

In regard to the treatment of idiopathic purpura hemorrhagica, splenectomy seems to be the outstanding method of treatment at the present time. The literature of the past few years is full of enthusiastic reports of cures by splenectomy. It is believed that in purpura hemorrhagica the spleen destroys blood platelets just as in splenic anemia it destroys the red blood cells, hence the rational of splenectomy in these diseases. In the acute fulminating cases of purpura hemorrhagica the results of splenectomy have been uniformly bad, but in the chronic cases many cures have been reported. Fitz-Hugh in the Atlantic Medical Journal, April 1926, says: "A critical analyses of these favorably reported cases show however that for several reasons, less than 50% can safely be classified as cures. In the first place the interval of apparent cure following operation is not long enough to establish a permanent status. Secondly, in many of the patients, there is a return of the blood to its previous state of thrombocytopenia with non-detractile clot within a few weeks of operation. In spite of this, however, with but few exceptions, the patients are returned to health and strength

and all active manifestations of the disease disappear soon after splenectomy." At the time of this report there were only ten cases reported in the literature that had attained the status of five year cures. Since that time the case presented by Dr. Morris Flexner, to the Kentucky Medical Association, Sept., 1924, has practically established itself as a five year cure and there are now probably other cases which might be added to the Fitz-Hugh report. In one of the most recent articles appearing in the British Journal of Surgery, January, 1928, the author, Allan W. Spence, basing his conclusion on a study of 61 reported cases, two of which were his own, states that "Purpura hemorrhagic may be divided into acute and chronic cases; and that splenectomy is beneficial in 80.9% of the chronic cases and in 16.6% of the acute.

CONCLUSION.

The number of reports of chronic purpura is not great. The case reported here does not seem to fit well into any of the usual classifications but from a purely symptomatic standpoint might well be considered as a chronic intermittent idiopathic purpura. The patient showed acute exacerbations of her purpura at intervals of six months following thyroidectomy in June, 1923, and purpuric spots had been noted since 1917. Following the injection of B. Coli vaccine the patient has had no recurrence of the condition for nearly fourteen months. The case is not pronounced as a cure and the favorable remission may be only a coincident. Splenectomy or x-ray treatment of the spleen seem to be most practical in treatment of some forms of thrombocytopenic purpuras whereas desensitization by vaccines or serums seems worthy of trial in the treatment of the chronic non-thrombocytopenic forms.

Fibrous Stricture of Intestine Following Herniotomy.—Eising cites two cases of slowly developing obstruction due to fibrous stricture of the intestine which followed operative relief of strangulated hernia. The type of hernia may be inguinal, femoral or ventral. A satisfactory appearance on careful inspection of the injured intestine and mesentery at the time of the operation for strangulated hernia does not yield absolute proof of the viability of the segment involved.

PENETRATING WOUNDS OF THE ABDOMEN: A STUDY OF SIXTY-NINE CASES.*

By ARCHIBALD M. McKEITHEN, M. D.
Louisville.

This study of penetrating wounds of the abdomen is based on a series of sixty-nine cases which came under my personal observation at the Louisville City Hospital during my residency in surgery there from July 1921 to July 1924. I operated upon forty-eight, other members of the house staff upon twelve, and nine were operated by members of the attending staff. The number of cases is not large nor does the mortality rate differ materially from other series which have been reported; however, a study of this series should prove interesting because of the various problems presented, many of which involve broad underlying surgical principles.

This paper only deals with those cases with peritoneal injury, which were operated upon. Those patients admitted in a moribund condition who could not be revived by resuscitative measures, and those cases in which an exploration of the bullet tract failed to reveal any peritoneal injury, are not included. Both gunshot and stab wounds are included, as the same principles apply to both, although as a rule stab wounds are not so serious because there is less hemorrhage and less visceral injury. In two of the stab wounds there were clean-cut incisions through the entire abdominal wall with protrusion of loops of lacerated intestine. In one stab wound, seen but not included here because the patient refused operation, a probe could be readily passed into the peritoneal cavity; the patient recovered experiencing no trouble.

The following is a summary of cases:

	No. Cases	Died	Mortality
Gunshot Wounds.....	56	25	44.6%
Stab Wounds.....	13	4	30.7%
Total	69	29	42.0%

There were fifty-five males, twenty-three of whom died, and fourteen females, six of whom died, giving a mortality rate for the males of 41.8% and for the females of 42.8%. The age ranged from 13 to 56 years, with an average age of 30 years. There were forty-four negroes and twenty-five white people. These patients were almost all in good physical condition, but a large proportion of them were more or less intoxicated.

The diagnosis is usually made without difficulty, especially if the wound of entrance is over the abdomen. There were several of

*Read before the Jefferson County Medical Society.

these patients who were shot in the thorax, the bullet ranging downward into the abdomen. One was shot in the hip and another in the buttock. In about 80% of them there was abdominal pain, tenderness, and rigidity on admission, and these signs can be found in practically every case with intestinal perforation if time is given for peritonitis to develop. If there is much loss of blood signs of fluid in the abdomen can be elicited. In case of doubt the x-ray or fluoroscope may be of great aid.

The organs injured in the order of frequency were: small intestines, liver, stomach, large intestine, pancreas, urinary bladder, kidney, and gall-bladder. In four cases seen no visceral injury was found. In my experience it seems to make little difference which of the viscera is injured, but rather the degree and type of injury; and the injury of two or more organs in the same patient tends definitely to increase the risk.

It was our policy on all patients to give preliminary treatment for shock on admission, that is, external heat, morphine, stimulants, and intravenous solutions, if we thought it was indicated. It was also our policy to operate upon all patients shortly after admission, especially if there was any evidence of hemorrhage, and if the shock had not been too great. Most of the patients were brought into the hospital by police patrol and were admitted within less than one-half hour after the injury occurred. Fifty-three of the sixty-nine patients were operated upon within one hour after admission to the hospital. In the others operation was delayed either because of slow recovery from shock or because of uncertainty of the diagnosis. I believe that unless the patient is in an extreme degree of shock that early operation is always to be preferred, because in most of them there is an appreciable loss of blood, and delay increases the hemorrhage and possibility of peritonitis as a rule. Fourteen of the twenty-nine patients who died succumbed within twenty-four hours after operation. Of this number twelve had lost a large amount of blood, and one had also been shot in the chest with resulting thoracic hemorrhage and lung injury. The largest individual factor in the mortality rate is dependent upon hemorrhage. Some of the records are incomplete as to the amount of blood lost and some are probably rather inaccurate. The following table shows results which have been recorded.

	No. Cases	Died	Mortality
Large Hemorrhage.....	25	13	52%
Moderate Hemorrhage.....	8	4	50%
Small Hemorrhage.....	17	5	29.4%

Mason in 1923 called attention to this fact, but his statistics differ materially from this series. He found 88.8% mortality in the large hemorrhage series and 21.8% in the small hemorrhage series. In our cases the amount of hemorrhage where recorded is large, moderate, or small, and in some cases the amount is estimated. When the amount is estimated as under 500 cc. I have included it in the small hemorrhage group, and over 500 c. c. in the large hemorrhage group. The time interval between injury and operation is also a factor in mortality rate, especially if the patient is seen late enough to have had peritonitis develop. Of the fifty-three patients operated within one hour after admission to the hospital there was a mortality of 41.5%, and of the remaining sixteen operated longer than one hour after admission there was a mortality rate of 53.8%.

In my opinion, ether is the anaesthetic of choice and was used in practically all of these cases. The incision should be made to the right, the left or in a median line, as indicated, and should be ample in length to easily permit of good exposure and thorough exploration without evisceration. Great care should be taken to protect any exposed intestines by keeping them covered with warm salt sponges.

As to what should best be done depends entirely upon the type and degree of injury in each individual case. If, on opening the abdomen, there is any appreciable blood to be found, the first thing should be to locate any bleeding points and control the hemorrhage. Intestinal perforations are usually double, although at times single. Suture of these perforations is usually preferable, although if there are multiple perforations close together, or if there is any extensive injury of the mesentery a resection is to be preferred. A resection was performed in ten of the cases of this series with a mortality of 60%. All of these patients who died were in the large hemorrhage series. In wounds of the liver nothing should be done unless there is hemorrhage, in which case packing with gauze will generally control satisfactorily. In wounds of the stomach we will generally find perforations on both the anterior and posterior wall. The perforation on the posterior wall may be sutured either by going through the gastrocolic omentum or by enlarging the opening in the anterior wall of the stomach and suturing it from within. Some perforations of the urinary bladder must also be repaired in this way. In one of these cases with two perforations of the bladder the peritoneum had not been injured and it was necessary to incise the bladder and suture both perforations from within. The bladder should be drained

suprapubically, or with a retention catheter. Always a very thorough examination of all abdominal organs should be made, and the entire gastro-intestinal tract should be explored as far as possible. Injuries to the kidney or ureter should be treated conservatively unless the damage is irreparable. Should the spleen be injured splenectomy is usually advisable. In one case of the series an unusual and interesting condition occurred in that the bullet, after penetrating the liver spent its force and came to rest within the lumen of the gall-bladder. A cholecystectomy was done. In injuries to the gall-bladder either cholecystectomy or a repair of the gall-bladder with drainage should be done. Two cases of injury to the pancreas in this series were also associated with perforations of the stomach. In both an attempt was made to repair the injury, and drainage was introduced to this point. However, there was a fatal result in both cases.

As to the question of drainage there is very little to be learned from a study of these cases. Excluding the one patient who died on the operating table, there were thirty-three cases drained with fourteen deaths, a mortality of 42.4%, and thirty-five cases not drained with fourteen deaths, a mortality of 40%. Personally, I do not believe in drainage except for a definite indication in each case. Perforation of the intestine or stomach even with gross contamination, is not, in my opinion, any indication for drainage, *if it can be satisfactorily repaired*. If it cannot be satisfactorily repaired a drain should be introduced down to this point. In perforation of the colon, if the retroperitoneal portion is injured, drains should be used. Any gross contamination should always be thoroughly sponged away. We cannot drain the general peritoneal cavity; within a few hours the drainage tract becomes walled off. Drainage allows for some decrease in abdominal pressure for the first few hours, and also for the escape of some of the bactericidal and phagocytic fluid which is put out by the peritoneum as a protective mechanism. For these reasons drainage should only be used where specifically indicated. For hemorrhage from the liver or elsewhere, which cannot otherwise be satisfactorily controlled, packing with gauze is indicated.

The deaths in this series, aside from those that might be attributable to hemorrhage and shock, were due to peritonitis, pneumonia, pericarditis, subphrenic abscess, and in one patient shot through the sacrum meningitis was the cause of death.

The post-operative treatment should strive to combat and prevent shock, hemorrhage, peritonitis, and pneumonia. Each patient

should be kept warm and thoroughly protected against any exposure. Keep flat in bed or with feet elevated until after recovery from shock, then place in Fowler's position. Intravenous saline and glucose may be beneficial. In the presence of hemorrhage transfusion is urgently recommended. We were greatly handicapped here by lack of donors, but during the latter few months of this period the Hospital made provision to pay donors, and I am sure that several lives were saved by transfusion. In every case if peritonitis does not exist actually it does potentially and should be treated as such. Nothing should be given by mouth or bowel for at least two to four days, or until after normal peristalsis has been established. Fluids should be given copiously either subcutaneously or intravenously, or both. Morphine should be used freely. Any other complications must be treated as they arise.

In conclusion, I wish to emphasize that hemorrhage is the most important factor in the mortality rate, and that the treatment of hemorrhage by transfusion is most urgent. Even when hemorrhage is not excessive transfusion may be of great value in combating shock, and it is one of our most valuable procedures in the treatment of penetrating wounds of the abdomen.

DISCUSSION

Frank T. Fort: Dr. McKeithen has given us a splendid paper along lines that many others have previously written. I believe every patient with a penetrating wound of the abdomen should be operated upon as soon as possible after receipt of the injury, provided shock is not so pronounced as to make operation extremely hazardous.

In my experience I have encountered quite a number of cases of this nature. One little girl aged seven years was shot with 22 caliber rifle, the bullet entering the abdomen near the umbilicus and emerging through the ilium above the great trochanter. She was operated upon immediately. There were half a dozen or more perforations in one portion of the small intestine, and four or five feet further, as many were found in another segment. A double resection was performed, and to my surprise the child recovered. On the fourth postoperative day she begged me to get her a bottle of beer, which I did, she drank it and began improving from that time.

Another patient was almost moribund when seen. He was operated upon at once, but his condition was so desperate that thorough search could not be safely made of all contents of abdominal cavity. At post mortem examination we found that the bullet had passed through the right kidney in addition to intestinal wounds.

I recall another case in which the patient had

a perforation of the liver. The wound in the liver was carefully packed, and the packing allowed to remain for two days. It was then removed and the man made a satisfactory recovery.

In a case seen prior to the one just related, according to the history, a man was shot in identically the same situation where President McKinley was shot. He absolutely refused operation and made a complete recovery. We all know what happened to President McKinley. In some instances individuals with small caliber gunshot wounds of the stomach recover without operative intervention. This is probably explained by the fact that the rather thick gastric mucosa effectually closes the small perforation. That is the only way I can account for the recovery of the man just mentioned.

I want to go on record as believing in operating upon every patient who has received a penetrating wound of the abdomen. If exploration discloses no visceral injury, the patient has been done no harm, and the surgeon's mind is at rest in that respect. Some of these patients show very little shock in the beginning, even though visceral damage may have occurred.

I think something might be said about the advisability of opening the abdomen and searching for visceral injury in cases where severe abdominal injury has been inflicted without external evidence of internal damage. I believe we are justified in operating upon the majority of such patients. I recall having written some time ago an article on "Visceral Injuries with no External Evidence." Of collected data the patients who were not operated upon, the mortality was about 90 per cent. Had all these patients been subjected to operation as soon as possible after receipt of the injury, no doubt many of them might have been saved.

George A. Hendon: Dr. McKeithen has read a very interesting paper presenting the question for consideration of penetrating wounds of the abdomen. Of course we all realize that a distinction must be made between penetrating and perforating wounds. A bullet or any other agent may penetrate the abdominal wall, and yet not perforate any vital structure. Some peculiar and almost incredible feats are often performed by bullets and other agents that are propelled through the abdominal wall. I recall one experience that surprised me very much. A man received a shot wound just below the ensiform cartilage. We found the bullet underneath the skin near the spinal column. The abdomen was opened with the expectation of finding hemorrhage and numerous perforating wounds, but not a single vessel of consequence was severed, not a vessel of sufficient size to require ligation. We can be fooled by external wounds, at least I know I can. I saw a patient who had

been shot twice in the region of the umbilicus. A bullet wound on either side. We turned him over and found two bullet wounds in his back, one on each side of the spinal column, corresponding to the ones in front. We opened that man's abdomen with the expectation of finding two bullet tracts through coils of intestines and found none. When we opened the peritoneal cavity and no blood appeared it was to our minds sufficient proof that no perforation had occurred. On further investigation we discovered that he had been shot while standing sideways to his adversary, one bullet entering at one side of the umbilicus and emerging from the other side, and the same thing occurred when he was shot in the back. These questions are always worthy of consideration.

I think it is very important, whenever we are justified in even suspecting a penetrating wound, that we open the abdomen without waiting for symptoms of perforation. The reason one is likely to be misled under conditions of this kind is the fact that when there is a bullet wound, or any other wound of the intestine, as was demonstrated by Nicholas Senn several years ago, the intestine contracts above the point of the lesion; that is, by sheer contraction of its own muscular wall the contents of the intestinal canal are prevented for a time from escaping through the wounded area. This is a phenomenon which is likely to mislead one in diagnosis and in identifying perforating wounds. If we wait before operating for symptoms of shock and general peritonitis to develop then we have waited too long, because when the circular muscular fibers of the intestinal wall become relaxed by exhaustion the entire contents of that particular segment are discharged into the wounded area. It has been demonstrated many times in the treatment of traumatic injuries of the intestine that this particular physiological function has resulted in the death of many people, particularly those injured by the kick of a horse or some other traumatic injury in which no external wound of the abdomen is produced. In such cases considerable time elapses between the receipt of the injury and the development of symptoms. Therefore it is always unwise to wait for symptoms. We all know that fatality results from hemorrhage, peritonitis and sepsis.

There is another point regarding the development of peritonitis and sepsis which should receive our most careful consideration, and that is the fact that many people with penetrating wounds of the abdomen have died because one perforation was overlooked. Some years ago that was quite a common cause of death. Those of you who have had experience in opening the abdomen and searching for wounded areas doubtless have a very vivid recollection of the difficulty of locating all the perforations. No

satisfactory method has yet been evolved which will entirely obviate these difficulties. Although the injection of certain gases, colored fluids, etc. has been resorted to, yet even at the present time there is always danger of overlooking some of the perforations.

One other feature I would like to bring to your attention is the question of drainage. Of course we all drain the peritoneal cavity by habit or by custom, but we ought to take into consideration drainage of the intestinal lumen, not only on account of relieving it of its fluid contents, but also relieving it of the gas accumulations that put a strain on the intestinal repair. I want to bring to your notice again, even at the risk of being tedious, a method of drainage of the intestine after injuries and operations that I have found to be a most excellent measure. Our plan is to locate the appendix, the mesoappendix is entirely divided; the appendix is brought through the lower angle of the incision, its end "clipped off" with scissors; a catheter is then introduced into the lumen of the appendix the eye end foremost, and one or two linen sutures inserted to hold the catheter in place. The distal portion of the catheter is allowed to protrude from the incision. You will find this a most remarkable help not only in providing a means for the escape of gas and liquid intestinal contents, but also for the purpose of introducing fluids and particularly hot water to combat shock. In my work with intestinal obstruction I have found placing a catheter in the lumen of the appendix and filling the colon with water at a temperature of 120°F.—the colon will hold almost half a gallon,—an excellent method of combatting shock, and thus protect the patient during operation. After that as much fluid may be introduced as one thinks proper. Medication and nutriment may also be introduced, and at the same time we get the benefit of drainage. If the mesoappendix is divided the appendix sloughs off on the sixth day and is thus disposed of. No fistula has ever resulted in the sixteen cases in which I have used this procedure.

D. M. Cox: Conditions in the city hospital must have been considerably better during Dr. McKeithen's service. Last year I am sure that from one to two hours elapsed after admission before the patients reached the operating room. Of course, some cases received earlier attention, but in the majority of instances there was a delay of nearly two hours between admission and operation.

The prognosis in penetrating wounds of the abdomen, as stated by Dr. McKeithen, depends largely upon the amount of hemorrhage and shock. Where there is an extensive gunshot or knife wound of any vital organ, the patient is almost certain to succumb. If there has been profuse hemorrhage before the patient is ad-

mitted, resistance may be so lowered that the patient will not survive. If hemorrhage has occurred in a situation where it cannot be otherwise controlled, packing with gauze is necessary.

The ultimate result depends more or less upon the organs which are involved. Wounds of the small intestine and stomach usually heal promptly, but in wounds of the large intestine infection is almost certain to occur. These are the cases in which drainage is generally employed, but infection supervenes and the mortality is high, particularly where the bullet or knife has entered the retro-peritoneal space, in which event, infection spreads much more rapidly than it does in the peritoneal cavity. These cases should be drained posteriorly, but even then the results are usually not very satisfactory.

Wounds of the liver may be either packed with gauze or sutured. I do not believe Dr. McKeithen said anything about suturing wounds of the liver, but this can often be successfully accomplished. The spleen however, cannot be sutured. Wounds of the kidney may be sutured or packed with gauze. We had in the hospital last year three patients with gunshot wounds of the kidney and ureter all of whom recovered.

As to the method of abdominal incision: The paramedian incision gives the best exposure in the majority of cases. However, if the wound is far posterior and high, sometimes we cannot explore the injured area through an anterior incision and some other method has to be employed. We had that experience in one case in which a man had been shot in the abdomen. We made an anterior incision and found nothing. A posterior incision was then made and we discovered a bullet wound of the descending colon. The injury was repaired, drainage instituted, and the patient made a satisfactory recovery.

I would like to mention one other case: A man was shot in the abdomen, the weapon being a shotgun loaded with bird shot. He came to operation fourteen hours after receipt of the injury. The small intestine was literally "peppered" with perforations, and so many of them had been sealed by nature's effort to repair the damage that we did not attempt to close more than one-third of them. The abdominal incision was closed without drainage and the patient made a satisfactory recovery. I agree with the essayist that drainage is seldom necessary in wounds of the small intestine.

I thank Dr. McKeithen for his splendid paper.

Wm. Edgar Fallis: I congratulate Dr. McKeithen on his excellent paper and thank him for the privilege of hearing it. In penetrating wounds of the abdomen it is quite true that we sometimes see the patient early, but oftener perhaps it is very late, many hours after receipt of the injury. Every now and then we encounter a case where we think the patient is going to die, but much to our surprise he gets

well. An example: I recall one instance in which a man was shot in the abdomen at two o'clock one afternoon and was brought to the hospital at three o'clock the following morning. In the meantime he had walked about town as if nothing had happened. At operation it was found that he had thirteen intestinal perforations, yet he had continued walking around town. On admission his pulse was 88, temperature 98° F. This was at three o'clock in the morning, thirteen hours after receipt of the injury. The wounds were carefully repaired and the abdomen closed with out drainage. The patient made an uninterrupted recovery. Every now and then we see such cases. I mention this instance merely to emphasize the fact that individual resistance has much to do with recovery of the patient, provided the operator is careful in executing his surgical procedure.

Archibald M. McKeithen (in closing): I thank the gentlemen for their discussion. I wish to emphasize that hemorrhage is the most important factor in the mortality of penetrating wounds of the abdomen, and by using blood transfusions more frequently, we can save the lives of more of these patients. By means of blood transfusion I believe we can materially lower the mortality rate.

The next important factor is early operation. The patient should be taken to the operating room as soon as possible after receipt of the injury provided shock is not too great. The mortality is less following early than late operations.

Surgery of gunshot and stab wounds of the abdomen is like any other surgery, the method of procedure adopted should be the one best suited to the individual case.

Bilateral Pneumothorax.—From the records of twenty-eight patients treated by simultaneous bilateral partial pneumothorax, the following conclusions are drawn by Kinsella and Mattill: The procedure is safe if reasonable care is exercised. It is not attended by discomfort to the patient. The operator should be experienced in the administration of pneumothorax, and able to carry a lung at any desired degree of collapse for a long period of time. Institutional care, with strict rest in bed and frequent fluoroscopic and roentgenographic control, is essential. Frequent refills are usually necessary to maintain an even compression, the lung being held at the best position to control the disease rather than at any preconceived position. Refills should not be done on the two sides on the same day. Dyspnea was not encountered except with the formation of fluid, or on rare occasions when the most favorable position of collapse was passed. An average vital capacity of 1,200 cc., or an average of 39 per cent of the theoretical normal, was found in the current series.

RECURRENT ABSCESS OF THE LIVER, CASE REPORT*

By **RICHARD R. ELMORE**, Louisville

To emphasize the atypical nature of the case to be herein reported, the following resume of the etiology of liver abscess is offered from Anders and Boston.

- (1) Climate, tropical or subtropical.
- (2) Occlusion of bile ducts, including that of gall stones.
- (3) Diseases of the gall bladder.
- (4) Pyemia.
- (5) Ulcers of stomach, duodenum, colon and appendix.
- (6) Dysentery. Kelsch analyzed 500 cases of hepatic abscess and found 85 per cent followed dysentery. Necropsy in 3680 fatal cases of dysentery is said by Woodward to have revealed liver abscesses in 21 per cent.
- (7) Introduction of pathogenic bacteria (cocci, bacilli, spirilla) into liver substance.
- (8) Suppurating wounds on scalp, rectal operations.
- (9) Intestinal parasites and foreign bodies taken into the stomach, ascaris lumbricoides, pins, fish bones, needles and buttons.
- (10) Acute or chronic local infections.

Of the foregoing, possible cholecystitis, and probable infected tonsils, were present in the patient whose history will be narrated.

Tice (Practice of Medicine) states that rupture occurs in about 28 per cent of all cases of hepatic abscess. In 168 cases reported by Tice the pleura, pericardium and lungs led in relative frequency as to the region into which rupture may occur. The stomach, colon, lumbar region, bile ducts, inferior vena cava and kidney follow in order, with rare case reports.

Symptoms: (1) Pain is constant in the hepatic region, and may radiate to the right shoulder; it is dull and aching in character. Pain may be relieved or intensified by postural changes. (2) Chills with or without fever and sweats. (3) Gastrointestinal symptoms are constant, but of varying severity, such as flatulency, epigastric discomfort, nausea and vomiting.

Inspection: Palpation and percussion yield valuable information.

CASE REPORT

The following case is reported through the courtesy of Dr. Irvin Abell and Dr. M. J. Henry. Date of first observation, April 3rd, 1926. Patient, M. B. Mc., male, aged 35, occupation expert accountant; height 69½ inches; average weight 160 pounds. Typhoid fever at the age of 13, is about the only item of interest in the past history. He had sev-

*Read before the Jefferson County Medical Society.

eral attacks of influenza during the period from 1923 to April, 1926. A dry pleurisy developed with two of the attacks of influenza. After an attack in March, 1926, the patient developed pain slightly to right of midline at level of ninth costal cartilage with muscular rigidity. Blood pressure 126.82, pulse 84, temperature 99° F. Weight at the time, 144 pounds.

The positive physical findings relate to tenderness and rigidity over upper portion of the right rectus muscle. An indefinite mass was noted in right epigastrium apparently continuous with the liver. Muscular rigidity and pain on palpation made satisfactory examination difficult.

Laboratory findings: Urine, acidity 100 (Harrower scale); blood count erythrocytes 4,070,000, leucocytes 12,100, hemoglobin 75 per cent. Roentgen-ray examination negative except right diaphragm shows adhesions and is partially fixed. Blood, Wassermann reaction negative. Blood culture negative.

With diathermy applied to hepatic region, light but nutritious diet and rest, the patient grew progressively worse. By May 6th, he was having sweats, the distress in right costal area was more intense and extended around chest to midaxillary line. His temperature was normal, leucocytes, 10,000, roentgen-ray study of chest and alimentary canal negative. On May 12th the patient requested more energetic treatment. The following report is taken from Dr. Abell's operative record of May 14th.

Left upper paramedial incision, center of same being over palpable mass which is apparently adhered to the abdominal wall. Opening the peritoneum above the mass, liver is found adhered to parietal peritoneum, and in separating this adhesion, an abscess cavity containing three or four ounces of pus was evacuated. It is difficult to say whether this cavity is within the substance of left lobe of liver, or whether the latter formed the upper wall. Specimen of pus taken for culture. Rubber drainage. Culture (developed a strain of streptococcus pyogenes).

The hospital record relates that convalescence was uneventful. The patient was dismissed June 6th, 1926, permanently relieved of his illness,—as we fondly hoped and believed.

August 1st, 1926, the patient developed some fever and was in bed for a couple of weeks. During my enforced absence from practice, he came under the observation of Dr. Morris Flexner, who made a thorough and skillful study of the case with negative findings. Duodenal drainage was practiced on two occasions, which, according to the patient, relieved his pain and fever. By

September the patient was once more "on the toboggan," losing weight and strength, unable to work more than a few hours daily. On October 14th the blood count registered 4,010,000 erythrocytes, 12,700 leucocytes, hemoglobin 75 per cent. The point of greatest tenderness at this time was directly over the gall bladder. Blood pressure 100-60, pulse 96. On October 16th, quoting from Dr. Abell's operating record:

Upper right rectus incision, gall bladder thick-walled, edematous, contains no calculi; right lobe of liver above gall bladder shows marked enlargement and induration, which, on aspiration, discloses the presence of pus. Gall bladder drained with rubber tube, large area on anterior surface of liver "walled off" with dry gauze, and abscess opened. Between six and eight ounces of pus evacuated. Drainage by two rubber tubes. Specimen of gall bladder and abscess cavity contents sent to laboratory for examination and culture. Both later reported negative. The patient again made an uneventful recovery, leaving the hospital November 3rd, 1926.

His next appearance was May 21st, 1927, with pain in right midaxillary region over eighth to tenth ribs. Blood pressure 100-70, temperature 100.2° F., pulse 100, weight 160 pounds. The tendon reflexes were moderately active. Tonsils large and ragged, but little secretion expressed from them on pressure. Questionable friction fremitus over lower area of pain, but right chest expansion normal; pronounced tenderness on pressure under right costal arch.

Laboratory report on stool: acid, excessive fermentation, very abundant undigested food debris, trace of occult blood, moderate amount of mucus; no blood, pus or parasites found on microscopic examination. Again quoting from Dr. Abell's record:

Patient admitted to St. Joseph's Infirmary, May 21st, 1927. Temperature 101° to 102° F., leucocytes 12,000. Exquisite tenderness in region of right lobe of liver. Patient was given 30 c. c. of one per cent solution of mercurochrome with marked reaction, temperature 103.5° F., nausea, vomiting, diarrhea. This treatment apparently had no effect on the pathology, as fever and leucocytosis continued.

The patient was given 30 c. c. of one per cent solution of gentian violet. May 25th. This was followed by subsidence of fever, the temperature becoming normal at the end of twenty-four hours, leucocytosis disappearing, and there was a marked decrease in tenderness in the hepatic area. A second dose of gentian violet administered June 4th. Patient dismissed June 6th with teeth and gums sore from mercurochrome. June 9th, leucocytes 9,600, patient feels well, has had no

pain nor tenderness in liver region since administration of gentian violet. June 10th, 28 c. c. of one per cent solution of gentian violet given intravenously.

Beginning June 15th, at Dr. Abell's suggestion, 1½ grain ampule of emetin was administered hypodermatically twice daily until twelve doses had been given. June 18th, leucocytes 8,000.

September 14th, patient reported as "feeling fine." Leucocytes 9,800, weight 160½ pounds. October 25th, "feeling quite well." October 27th, history of nose cold appearing, which by November 3rd, had extended to trachea with abundant expectoration. Blood pressure 110-80, pulse 88, temperature 99.6° F. No rales, some tenderness in epigastrium. November 5th, the patient received gentian violet, which was followed by lowering the temperature and leucocyte count. He was then given five grains of sodium cacodylate intravenously three to five times weekly.

Last blood count February 24th, 1928, erythrocytes 5,150,000, leucocytes 8,600. Examination in June, 1928, showed the patient to be in good physical condition.

DISCUSSION

M. J. Henry: The case reported by Dr. Elmore is interesting because of several factors. What was the original focus of the disease? This was not ascertained by us, though we did get a positive streptococcal growth from the first abscess, which as Dr. Elmore has stated, was in the left lobe of the liver. The second abscess was not an extension from the first, but a separate and distinct abscess. It was interesting also to know that culture from the gall bladder itself was negative, which would lead one to believe that very likely the infection did not start there. Most interesting is the fact that the infection was effectively controlled by the intravenous introduction of gentian violet after failure resulted from the use of mercurochrome. We have used gentian violet in the treatment of massive infections with decided benefit in many cases. In this particular instance I believe the use of gentian violet obviated the necessity of a third operation. We had already opened two abscesses of the liver and felt that we were not having success in trying to cure the infection by operative means. However, it was very effectively controlled by the administration of gentian violet. I saw the patient about a month ago and he was apparently in perfect condition.

George A. Hendon: This is a very interesting report, because very few people live to have two abscesses of the liver, they usually succumb to the first one. I am particularly interested in the intravenous medication that was employed. About a year ago a man came under my observation who gave a history of two attacks of

illness attended by chills, high fever and marked jaundice. He was finally brought to operation under the impression that there was common duct obstruction. When the abdomen was opened the common duct was found perfectly clear and patent, no calculi being present, but the liver was enormously swollen and studded with a multiplicity of foci, small yellow punctate lesions that led one to believe they were small abscesses. Before beginning the operation upon this patient, my venoclysis outfit was adjusted and the administration of 10 per cent glucose solution started. This was continued throughout the operative procedure which merely consisted of an exploration. The gall bladder was opened and found to contain some tarry bile. A tube was anchored in the gall bladder, but no drainage occurred. The operation was performed on Friday morning, and venoclysis was continued at the rate of about a quart every six hours or approximately a gallon per day, with 10 per cent glucose solution. By Monday the jaundice had entirely disappeared, the temperature was normal, and the patient began making very rapid progress toward recovery. There was no drainage from the gall bladder until about the time the tube was removed fifteen days after the operation. When the patient went home, he was apparently in perfect health. Venoclysis was discontinued after seventy-two hours, as there appeared no further indication for its use.

After the patient had been home about a month, he began having pain, which simulated gall stone colic. He returned to the hospital and upon my advice cholecystectomy was performed. When we opened the abdomen the second time, the liver had receded to its normal size, it was perfectly smooth, there were no spots to be found upon it anywhere. The gall bladder was removed, the patient made an excellent recovery and has since remained well.

My reason for mentioning this case is to suggest that there is another way of practicing intravenous medication. I am sure if glucose or dextrose solution be given in sufficiently large quantities that it is a safe and efficient antitoxic and antiseptic process. Not only in the instance just described, but in several others I have seen marked toxemia from various infections subside after periods ranging from seventy-two to one hundred and twenty hours of continuous administration.

My original opinion was that the benefit derived from this method of treatment was due, first, to dilution of the toxins, and in addition the nutritive value of the dextrose, because we know dextrose contains four calories to the gramme; but added experience seems to show that when given in large quantities, it has a definite antiseptic and antitoxic effect. A 10 per cent solution is generally used, and we give from 4000 to 6000 c. c. in twenty-four

hours. In acute septic infections, I have given 6000 c. c. of a 10 per cent solution within eighteen hours with marked beneficial effects.

Irvin Abell: Most of the points of interest in connection with Dr. Elmore's case have been mentioned by Dr. Henry. The majority of the cases of abscess of the liver that have come under my observation have been secondary to gall bladder infections. In this particular instance it was impossible to demonstrate any connection between gall bladder disease and the liver abscess. This patient was one of three coming under observation within a short period of time, presenting abscesses of the liver. One was due to amebic infection in which we were able to demonstrate the amebae in the abscess sac. Another had an abscess in the left lobe of the liver, which appeared to be the primary focus. In the case Dr. Elmore has reported there was a recurring abscess, the second one appearing in a different location from that of the first and we could not demonstrate any causative factor. We know this about the streptococci, that they may remain latent in various portions of the body for indefinite periods of time and then suddenly again become virulent. We have an illustration of this in pelvic infections. The streptococcus may remain quiescent in the broad ligaments or walls of the oviducts for long periods of time and then suddenly give evidence of renewed activity. The focus of infection in this particular instance none of us were able to determine. The patient was seen by several others and they too were unable to discover it.

A very important point, I think, in this particular case is the beneficial effect of intravenous administration of gentian violet. We first tried mercurochrome, but the reactions were violent and the improvement unsatisfactory. However, he reacted promptly to the gentian violet and at the present time seems practically well.

Dr. Hendon has mentioned an extremely important point, the intravenous introduction of glucose solution. I believe this is especially valuable in hepatic infections, particularly in the toxemia and hepatitis accompanying cholecystitis. In my own experience I am confident that in gall bladder infections accompanied by infection of the liver tissue much benefit has been derived from the administration of glucose. We have been in the habit of administering glucose solution intravenously in 5 per cent solution, in quantities of 500 to 1000 c. c. at a time. Of the more concentrated solutions (50%), we have used 50 to 100 c. c. I am confident that the mortality accompanying infections of the liver has been materially reduced by the use of glucose solution.

R. R. Elmore, (in closing): Dr. Hendon's method of using glucose contains many interesting possibilities. It is well to keep in

mind the experiment of Thalhaimer and others who gave continuous injection of dextrose solution over a prolonged period of time to a normal non-diabetic individual with blood sugar estimates at frequent intervals. It was found that blood sugar rises sharply at first and continues at a high level for a time, after which there is a steady fall in the amount despite the constant inflow of dextrose from the injection. This fall continues, if the injection is kept up, until the blood sugar may become less than normal and symptoms of hypo-glycemic reaction may occur.

ESOPHAGEAL DIVERTICULUM: CASE REPORT*

By **L. WALLACE FRANK, A.B., M.D., F.A.C.S.**
Louisville

The patient, Mrs. B. L., aged 54, appeared for examination and advice October 9, 1928. Her family history was negative. Forty years ago a benign tumor was removed from each breast. No other illness.

Present condition began seven years ago with a sensation of something in the throat causing the patient to want to regurgitate or swallow it. This continued for quite awhile with no difficulty in deglutition but occasionally slight strangling.

Three years ago the patient began to think she had a "sac in her throat" and that food lodged therein. Coughing often occurred after eating and she would regurgitate the last portion of food eaten. There was no nausea associated with it. When she had vomited this material she felt entirely relieved, except when reclining at night she swallowed and regurgitated a large amount of mucus. Liquids were swallowed without difficulty, but effort was required to swallow solid food some of which seemed to lodge in her throat more on the left side. Her appetite was good but she had lost ten pounds in weight during the last three years. No cough except that associated with the expectoration of food. She had not vomited blood nor passed any blood with the feces. Her history was otherwise essentially negative.

Physical examination: Patient an elderly woman weighing 180 pounds. Blood pressure 160-98. Thyroid gland negative; heart about normal size, irregular at times, no murmurs; lungs negative. Breasts show scars of previous operations; no other abnormalities. Abdominal examination negative.

The patient was given barium to swallow and a roentgenogram made. The picture shows a definite diverticulum, 1½ inches wide by 2 inches long, beginning on a level with the sixth cervical vertebra and extend-

*Read before the Louisville Medico-Chirurgical Society.

ing behind the sternum and clavicle.

The blood count was normal and the urine negative. Urea nitrogen 13 milligrams per 100 c. c. of blood.

The patient was sent to the hospital and we had Dr. C. G. Lucas see her in consultation. While there he irrigated the diverticulum on two or three occasions in preparation for the operation which was to be performed.

Operation, October 20th, according to the method devised by Charles H. Mayo, by the two-stage procedure. At the first operation a vertical incision was made on the left side along the anterior border of the sternomastoid muscle; the blood vessels were retracted to the outer side and the thyroid and trachea to the inner side thus exposing the esophagus. The diverticulum was dissected free to its neck and brought through the wound, being simply isolated with gauze packing, a couple of sutures being inserted through the skin to hold the esophagus in place and leaving the sac exposed.

Ten days later the gauze was removed from the neck exposing the sac which was excised, fresh gauze inserted for drainage, and the wound then closed. The gauze strips were removed four days after the operation, the patient left the hospital with practically no drainage, in good condition, and having no difficulty whatever in swallowing.

Since this report was made the patient was examined fluoroscopically and there is no sign of pouching in the esophagus nor any delay of the bolus at the operation site. She is feeling fine, eating everything and has made a perfect recovery.

This case is recorded because esophageal diverticula are relatively rare, one does not see many of them in the course of several years practice. The method of handling this case surgically has been adopted by the majority of surgeons. There are two standard methods of surgical procedure in these cases. The method devised by Charles H. Mayo, which was used in the case reported, I believe is the best, namely, the two-stage operation, first simply isolating the sac with gauze and allowing the lower portion of the cavity to fill with granulations. In the majority of these cases when the sac is excised there is slight leakage, and if the lower area is not "walled off" with granulation tissue fatality may ensue within thirty-six or forty-eight hours, due to mediastinitis. That is the advantage of the two-stage operation devised by Mayo. The other method, devised by Bevan, consists in placing a pursestring suture around the diverticulum and inverting it into the esophagus. This is often a satisfactory method of dealing with small diverticula, but in the larger ones it has a distinct disadvantage which has been proven by a few reported

fatalities. The sac which was inverted into the esophagus was "coughed up" blocking the entrance to the larynx and the patient strangled to death.

In the case reported the patient had a true pulsion diverticulum. Nearly all these diverticula are mostly small and very frequently the apex of the sac is higher than its mouth, consequently it empties itself and causes the patient no discomfort.

DISCUSSION

Charles G. Lucas: In the case reported Dr. Frank had the advantage of a very good roentgenogram, which showed the exact location and size of the diverticulum. On my first attempt to irrigate the sac I was a little uncertain about the tube having entered the diverticular opening; but the second time, two days afterward, I was sure the tube was properly placed and the contents of the diverticulum removed. The day before operation irrigation was again practiced and the water returned perfectly clear. The patient was in very good condition at the time.

I have had the misfortune to see quite a number (between 12 and 15) of patients with esophageal diverticula. I believe the method employed by Dr. Frank in the case reported is the best operative procedure. Several years ago I was in Philadelphia and saw a patient operated upon by the Jackson method in which the esophagoscope is introduced directly into the diverticulum itself and the sac then excised. However, that patient did not have a good result. Another patient operated upon shortly afterward in the same institution by the two-stage procedure had a perfect result; but following the second operation they introduced a tube into the esophagus and allowed it to remain for ten days.

I want to mention two of the most interesting cases of this kind that have come under my observation. One was in a man who had a diverticulum in the lower third of the esophagus. The other was in a woman of 55, who had bilateral diverticula. A Laevin's tube was introduced into the mouth of the diverticulum and irrigation practiced until the water returned clear. For the first few days the tube generally passed into the left side, occasionally into the right. The following day the tube passed into the stomach, where it was allowed to remain for thirteen days. Complications developed and the patient died in a week or ten days.

I have under observation now a man, who has an esophageal diverticulum not much larger than the tip of my finger. I see him at intervals. He has been examined by several throat specialists, who were unable to find the diverticulum. In the last six months he has had no trouble whatever.

One of the strangest features about these cases is the large quantity of mucus expectorated

ed particularly when the patient is in the recumbent posture. The woman with the bilateral diverticulum took a towel to bed with her because she expectorated such a large amount of mucus during the night.

Pulsion diverticula are due to weakness of the muscle fibers of the esophagus plus constant straining or coughing. In traction diverticula, such as one seen with Dr. Cuthbert Thompson some time ago wherein a woman had a diverticulum in the lower third of the esophagus, the patient had a pleural effusion with inflammation of some of the lymphatic glands. When the inflammation subsided traction took place and a diverticulum resulted.

L. Wallace Frank, (in closing): The walls of pulsion diverticula of the esophagus consist of mucosa and submucosa. There is probably congenital weakness of the muscularis. The most of them occur rather late in life. According to statistics from Mayo Clinic, the average age is 54 years. In the last series I saw reported there were forty cases, the average existence being five to six years. The normal contractions of the esophagus result in impaired muscle tone, thus predisposing to the development of pulsion diverticula.

NEWS ITEMS

To the Editor:

Louisville, Ky., Jan. 15th, 1929

Would you kindly publish in your next issue the following corrections in my article that appeared in the January number. The errors that I am seeking hereby to have corrected are no wise the fault of the Journal, but entirely due to imperfect proof reading on my own part.

In the second column on page four the following sentence occurs "After numerous examinations sugar was found in the urine and 149 Mg to the c. c. of blood." The sentence should read "149 Mg to the 100 c. c.'s of blood." On page five the following statement occurs, "We have never had any suppuration," that should be corrected to read, "We have never had any suppuration except in the diabetic case before mentioned and one case in which a serious rupture of operative technique occurred in the operating room."

G. A. HENDON.

Dr. F. W. Urton announces the opening of his office, 648-654 Francis Building, Louisville. Practice limited to Eye, Ear, Nose and Throat.

Dr. R. Hayes Davis, announces that after January 1st, 1929, Dr. David L. Hill, will be associated with him in his practice of Internal Medicine and Diagnosis. Suite 800-810 Brown Building at Louisville.

WOMAN'S AUXILIARY NOTES

RADIO

Auxiliary members will be interested in the radio programs given from 5:00 to 5:15 o'clock each Tuesday afternoon, beginning January 8th, by the State Board of Health through the courtesy of W-H-A-S, the radio station of the Louisville Courier-Journal and the Louisville Times.

You and your friends are invited to tune in for these programs and then send your comments to the speakers who will appreciate your interest.

PUBLIC HEALTH MANUAL

To each physician who is a member of the Kentucky State Medical Association, a copy of the Public Health Manual was mailed in October, 1928.

These Public Health Manuals, bound in a heavy blue paper and containing 390 pages, are valuable to the physicians and also to the citizens at large for use as reference to the Health Laws of Kentucky and the Rules and Regulations of the State and local boards of health.

Unfortunately, the publication and distribution of this valuable manual was limited because of the recent disastrous reduction in the appropriation of the State Board of Health, so that it is impossible for each citizen to possess a copy of this book and there probably will not be another edition for ten years.

However, the members of the Auxiliary may have access to it by borrowing their husband's or their father's copy. Much interesting and instructive reading will be found in it. Undoubtedly, a course of study in this manual would prove helpful in a series of Auxiliary meetings or tea parties.

Do you trade at a grade-A grocery store? See pages 265-267 and then examine your store to see if it measures up to grade-A. How many hotels in your county are grade-A? See pages 288-298 and after examining your hotels you will have a better idea of what the travelling public thinks of your town for tourists judge a community largely by the accommodations they have received at the hotel. What assurance have you and your family while travelling on a railroad train, that the drinking water provided is safe to drink? See pages 303-304.

Do you know the source of infection, mode of transmission, incubation period, period of communicability and methods of control for the communicable diseases such as measles, typhoid fever, tularemia, whooping cough, etc? These are all briefly given in alphabetical order on pages 144-185.

Included in this volume also, are other health laws, many of them copied in several states and with which each citizen should be familiar to-

gether with the names of the members of the State Board of Health, a description of the several bureaus carrying on the detail work of making Kentucky the desirable State in which to live and its people the healthiest, happiest, longest lived.

THE LIVING CHRISTMAS TREE

What could be more truly fitting as an Auxiliary project than the planting of a living Christmas Tree beneath the windows of the local hospital? Does this not truly typify the beautiful Christmas spirit combined with the object of the Woman's Auxiliary "to extend the aims of the Medical Profession" by bringing the health giving qualities and the pleasure of a living tree nearer the intimate lives of the patients confined to a hospital?

Mrs. D. J. Williams, President of the local County Auxiliary suggested this project and the first living Christmas Tree planted by an Auxiliary was the stately cedar planted December 14th, 1928, near the front entrance of the King's Daughter's Hospital at Gulfport, Miss., by the Woman's Auxiliary to the Harrison County Medical Society.

Representatives of the King's Daughters, the Hospital Medical Staff and the Woman's Auxiliary, and several guests were present at the ceremony which included the digging of the hole and the placing of the tree. The president of the auxiliary threw the first shovelful of dirt around the roots of the tree and later, formally presented the tree. Gracious responses were made by the president of the King's Daughters and by a member of the Hospital Medical Staff. The State Forester made a stimulating address. Other addresses and a poem "Plant a Tree" by Lucy Larcom completed an impressive ceremony held in the balmy winter sunshine and overlooking the sparkling beautiful blue waters of the Gulf of Mexico.

"Oh, a tree is a psalm of beauty
Yes, a tree is a green leaved prayer;
A tree is a benediction,
From those who planted it there.
When you pause by the roadside weary,
And rest beneath its shade,
Say a prayer for the kindly heart
That this provision made."

SCRAP BOOKS

Does your County Auxiliary have its own Scrap Book. And is this Scrap Book kept up to date? If so, you have a rich possession, which will grow increasingly valuable with the years. Think what a treasure such a book would now be to the Medical Profession if it had been kept from the earliest organization years!

Our National Organization, the Woman's Auxiliary to the American Medical Association has a magnificent, full newspaper size Scrap

Book, with a place for each State's collection, including a map of the State showing the county divisions and a red star for each county organized, all carefully kept by the historian, Mrs. E. V. DePew, of San Antonio, Texas.

The Woman's Auxiliary to the Southern Medical Association has the first and oldest of all the Auxiliary Scrap Books. It is this year kept again by Mrs. A. T. McCormack, Louisville.

Several of the State Auxiliaries have their own Scrap Books. Kentucky has the oldest State Scrap Book and won the prize at the exhibit during the meeting of the Southern Medical Auxiliary in Ashville, November 13, 1928. This book contains a wide variety of material including a list of the women present at the organization meeting at Crab Orchard, September 19, 1923; a copy of the first Constitution and By-Laws; copies of several of the first organization letters; kodak pictures of a part of the house in which it is said Jane Todd Crawford lived in 1809, near Greensburg, Kentucky and a copy of the transcript of three transfers of property with her signature and that of her husband, Thomas, taken from the Green County Court House records; newspaper publicity of National, Southern, State and County Auxiliary activities; programs; badges; year books, etc. Mrs. J. W. Sams, Crestwood, has charge of the Kentucky book this year. Please send copies of your valuable material—newspaper notices and pictures, programs, year books, etc. to these Historians for preservation in the State National and Southern Scrap Books, remembering that what seems commonplace today, may be very valuable a few years later.

The Graves County Auxiliary won the prize at Richmond during the 1928 State Annual meeting, for the best County Scrap Book. This was the first exhibit of more than one Auxiliary Scrap Book. The Graves County Book is beautifully kept and artistically illustrated. Among other valuable things, it contained forty-seven original historical sketches of pioneers in medicine in Graves County, all obtained this last year by Graves County Auxiliary members although few of them were written by the members themselves.

May we not here respond to several questions concerning Scrap Books?

Any form of Scrap Book may be used but the most satisfactory form yet found seems to be the Ideal Scrap Book Number 21 B, found at almost any stationers. W. K. Stewart & Co., 550 South Fourth St., Louisville will be glad to fill mail orders, price \$1.50. Each book contains fifty leaves but is an extension type and extra leaves may be added. Extra leaves cost twenty-five cents for twelve.

Mrs. J. N. McCormack, Louisville, contributes the following receipt for an excellent paste

which can be put into small jars and kept indefinitely, in a cool place.

Home Made Paste

Make a smooth, creamy paste by stirring cold water into one cupful of flour. Pour over this four cups of boiling water, stirring all the time. Add one teaspoonful of powdered alum and cook five minutes. Strain into a bowl and let stand until cool but not long enough to become firm. Then, add one teaspoonful of carbolic acid and one teaspoonful of oil of cloves or oil of wintergreen. Pour into little jars and cover with paraffin.

JEFFERSON COUNTY AUXILIARY

The annual winter luncheon meeting of the Woman's Auxiliary to the Jefferson County Medical Society was held Tuesday, December 3rd, at 12:30, in a private dining room of the Kentucky hotel, with Mrs. G. A. Hendon, president, presiding. There were about eighty women present.

The guest of honor was Dr. Granville Hanes, Louisville, president-elect of the Kentucky State Medical Association. Dr. Hanes spoke on "Medical Auxiliaries", their social, philanthropic and educational values. He stressed the educational value particularly, stating that as an auxiliary we could do much in the way of religious and medical education of those who are not so fortunate as ourselves. Speaking naturally of our value as an auxiliary to our doctors, Dr. Hanes outlined a few of the important educational subjects upon which we could work such as: Food, Habits, Prevalence of Cancer, Care of Teeth, Tonsils, Exercise, Marriage Laws, etc. In conclusion he congratulated the auxiliary for the work it has done and all that it is trying to accomplish during the year.

We were then entertained by piano solos and soprano solos by Mrs. Roland Buford and Miss Harbison.

A report of the following committees was given:

Historical—Mrs. W. F. Boggess; Membership—Mrs. J. K. Freeman; Scrap Book—Mrs. P. E. Blackerby; Hygeia—Mrs. W. G. Salisbury.

Mrs. Freeman turned in the names and dues of forty-three new members, which she secured during the drive. There are now one hundred paid up members in Jefferson County this year.

Mrs. J. W. Sams, Crestwood, Recording Secretary of the Auxiliary to the Southern Medical Association, was present and told us about the honor and prize accorded the Kentucky Scrap Book at the Southern meeting in Asheville and exhibited the blue leather folding clock, which we had received as the prize.

Mrs. A. T. McCormack, past-president of the Southern Auxiliary, then gave us a short account of the Southern meeting, which she described beautifully and accurately as is her custom.

As there was no further business, the meet-

ing was adjourned to meet again in the spring for the election of officers.

Respectfully submitted,
MRS. D. A. BATES, Secretary.

The annual banquet of the Woman's Auxiliary to the Taylor County Medical Society was held on the evening of December 6th, at the home of Mrs. J. P. Gozder. Besides a general discussion of the problems that face the local organization, Dr. A. T. McCormack made an address, stressing the value that the influence of women can have in the promotion of health.

A check for \$10.00 was received by the treasurer a few days ago from the Madison County Auxiliary as a gift to the State Treasury from that auxiliary. This is the third contribution, the others being Garrard, \$5.50 and Perry, \$15.00.

BOOK REVIEWS

DISEASES OF THE EAR, NOSE AND THROAT, MEDICAL AND SURGICAL. By Wendell C. Phillips, M. D. Ex-President American Medical Association, formerly Professor of Otolaryngology, New York Post Graduate School. Surgeon to Manhattan Eye, Ear and Throat Hospital. Fellow and Ex-President of the American Laryngological and Rhinological Society; Fellow of American Otolaryngological Society; Ex-President of Medical Society, State of New York. Seventh revised and enlarged edition. Illustrated with 615 halftone and other text engravings. Many of them original; including 37 full page plates. Some in colors. F. A. Davis Company, Publishers, Philadelphia, 1928. Price \$9.00 net. This volume has been for years a text book by the majority of medical schools and libraries and a reference book by many medical institutions and libraries in foreign countries. It has been extensively revised and all the obsolete methods have been eliminated. Changes have been made in recommendations for office equipment, with illustrations of improved paraphernalia for the examination of ear, nose and throat patients. Infantile mastoiditis and para nasal sinus infections wherein gastro-intestinal symptoms predominate have been given due attention.

All the new developments in these subjects have been thoroughly discussed.

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COUNTY SOCIETY REPORTS

Breckenridge. Resolutions adopted by Breckenridge County Medical Society up on the death of Dr. S. P. Parks.

Whereas, God in His infinite wisdom has called from our society the beloved physician, Dr. S. P. Parks, therefore, be it resolved

That the Breckenridge County Medical Society expresses its sense of loss in his passing, always active in his profession, ready to help in every good work with a wonderful gift of friendship for his fellow physicians he will be most missed in every interest our Society stands for.

His vision, his deep interest, his untiring zeal have been an inspiration, and his life among us an influence for which we should ever be thankful and further be it resolved,

That we express to the wife, sons and other relatives of our deceased friend, our heart felt sympathy.

We command them to our Heavenly Father and further be it resolved,

That a copy of these resolutions be sent the family, the Journal, The Irvington Herald and The Breckenridge News.

JOHN E. KINCHELOE, Secretary.

Franklin: The Society met in regular monthly session Thursday, December 6th, 1928.

Dr. John P. Stewart had charge of the program and the meeting was held at his home at 12 o'clock, noon. The first part of the program was an elaborate course dinner, which was followed by the business session and the election of officers for the year of 1929.

The Society was then taken through the different units of the Stewart Training School for Children of Backward Mental Development.

Members present were: Dr. John P. Stewart, the host, Drs. G. A. Budd, A. M. Jackson, G. H. Heilman, F. M. Travis, R. B. Ginn, E. C. Roemele, R. M. Coblin, John Patterson, C. E. Youmans, J. W. Wilson, A. M. Lyon, C. T. Coleman and L. T. Minish. Guest: Dr. Witherspoon, of Lawrenceburg.

Dr. John P. Stewart was elected President; Dr. G. H. Heilman, Vice-President; Dr. L. T. Minish, Secretary-Treasurer; Dr. F. M. Travis, Delegate; Dr. John Patterson, Alternate.

A motion was made, seconded and carried, that the President appoint a committee to assist the Frankfort Chamber of Commerce in its efforts to secure the U. S. Government Hospital (that is to be located in Kentucky) for Frankfort.

Drs. E. C. Roemele, C. T. Coleman and L. T. Minish were appointed on this committee.

On motion of Dr. F. M. Travis, a rising vote of thanks was extended to Dr. Stewart for the delightful dinner and entertainment given to the society.

L. T. MINISH, Secretary.



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KENTUCKY MEDICAL JOURNAL



Being the Journal of the Kentucky State Medical Association

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No. 3

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Every fact, every change in our knowledge, every important step in medical history has been examined, weighed, and if noteworthy, included in the *New 4th Edition*. The valuable chronology of public hygiene and medicine has been greatly increased. So numerous and widely distributed were these additions that it was necessary to re-set the entire book—now nearly 1000 pages!

The *Journal of the American Medical Association* says this of DR. GARRISON'S HISTORY OF MEDICINE: "Compact and crowded with facts, but pleasant reading throughout; clear and concise, rich in happy phrases, apt quotations with occasional flashes of humor and many historical and cultural allusions."

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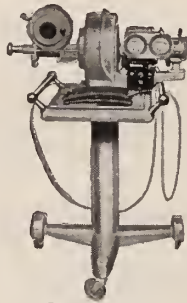
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BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XXVII.

BOWLING GREEN, KY., MARCH, 1929

No. 3

EDITORIAL

OUR ANNUAL MEETING

The date of the annual meeting of the Kentucky State Medical Association has been definitely decided upon as October 21-24, and will be held in the Brown Hotel, Louisville.

This meeting is arranged so that it will not conflict with any of the other National medical meetings, and as this season of the year affords Kentucky's most delightful climate, we want to urge every doctor to begin preparing to attend this meeting and to make a holiday for himself and his family.

The stores will welcome the wives and daughters for their fall shopping, and the golf courses at that time of the year are in splendid condition and arrangements will be made whereby the physicians can have access to any of the five beautiful courses in Jefferson county.

THE WORKMEN'S COMPENSATION LAW

Physicians in all of the industrial sections of the state are constantly realizing the serious defects in the Kentucky Workmen's Compensation Law. That these defects are also realized by the leaders of industry and by the labor organizations of the state is shown by the creation by the last General Assembly of a commission to revise this law.

In order that the profession may be properly represented before this commission, President Blackburn has appointed the following committee to represent the Association before the commission.

Doctor W. H. Rice.

Doctor A. H. Bryson.

Doctor C. B. Preston.

Doctor J. L. Salmon, Chairman.

It will be noted that all of the members reside in Ashland. Doctor Blackburn felt that a committee so selected would be able to work along definite lines because they could meet frequently.

Doctor Blackburn asked the JOURNAL to request physicians who are familiar with the Workmen's Compensation Law to write him frequently in regard to defects in the present law and suggestions for practical amendments which will make it more effective.

WE NEED CO-OPERATION

Of course we know that our readers are utilizing our advertising columns every day. We know this because we are constantly coming in contact with grateful physicians who are telling us about it. However, our advertisers do not know this. The address given at the bottom of practically every advertisement is an exclusive address used for this JOURNAL alone. We want to request every reader of this editorial to look through the advertising pages of each issue and write to the advertiser for samples, catalogues or whatever he has to offer, if you are interested in his product.

The advertisers pay for the publication of the JOURNAL. Every dollar received from them is spent for making a bigger and better JOURNAL. It would cost each of our readers about \$8.00 a year to publish this JOURNAL if it were not for the advertisers. They are a very carefully selected group. We could easily have ten times as many pages of advertisements if we could accept all of those offered. But we only accept official announcements as made by representative firms whose statements we can stand squarely behind. For many years the JOURNAL has guaranteed its readers against financial loss from patronizing our advertisers.

Please look through the advertising pages of this issue and subsequent issues and let our friends, who are helping us so much, know that we appreciate their assistance.

HEALTH APPEAL

From time to time something in the state of the Nation makes a strong appeal to an Editor as the subject for a leading Editorial. We had had in mind for some days an expression of our outrage at the utterly outrageous character of a considerable class of conspicuous, even blaring, advertising that is appearing in print and in the air these days. Just as we had poised our pen, however, the JOURNAL of the American Medical Association for December 8th last came along expressing all of our thoughts so much more forcibly than we had been able to untangle them from the ether that we are reproducing an editorial from its versatile

editor which we feel sure will meet with the approval of our readers.

HEALTH APPEAL

The advertising writers of our progressive land have found that the word "IT" in their profession means "Health Appeal." A cursory inspection of current periodicals indicates no lessening of the attention to the health angle. The folly of the all-or-nothing policy in foods, the ridiculousness of some of the arguments as to vitamin content, the preposterous claims for glorified antiseptics, the cautious venturings of time-tried tonics into the public field, and the dazzling claims of the promoters of light arouse the risibilities of the physician by their startling inconsistencies if not by their exaggerations. Who would have thought ten years ago that cigarets would be sold to the American public not only by billboard displays of handsome damsels revealing unusual quantities of hosiery and epidermis, as they nonchalantly exhale streams of smoke from adenoidal nostrils, but actually by insistence on the healthful qualities of certain brands? Ah! brothers, we have come a long way in the passing decade!

In the periodicals for December the remarkable testimonial to the effect that Mrs. Whoozis, who could not even push the baby buggy, was able, after taking some yeast, to swim four times across the swimming pool at the country club, has given way to the assertion by Sir Arbuthnot Lane that yeast is what he thought the intestinal kink was ten years ago. The picture of Miss Rivergrove, Nevada, clad in a one-piece bathing suit, who attained her present high state of pulchritude on a yeast diet, has given way, alas, to that of a heavily moustached Belgian professor who asserts, in a personal interview, that yeast is a marvelous laxative, or to that of a heavily bearded Teuton who has concealed himself behind his sage-bush so efficiently as to fail to realize that in America respectable physicians do not condone such public unveiling.

The growers of Japan tea, moved, no doubt, by the promotional efforts of the growers of coffee, assert in several popular publications that Japanese tea is the stuff to drink because it has vitamin C. Clever people, these Japanese! Nevertheless, Mattill and Pratt have concluded on the basis of scientific evidence that in everyday nutrition, despite its fairly high content of vitamin C, green tea has limited value as an antiscorbutic. "It cannot be used by children," they say, "and should not be used by adults to replace natural foodstuffs which meet additional nutritive requirements." The American advertising agency that promotes the Japan tea campaign was fully informed as to the lack of

scientific evidence for the claims made, but presumably, like some other advertising agencies, it is more interesting in lineage than in evidence.

Fellow's Syrup, long the inhabitant of the pages of medical advertising mediums that do not follow the Council on Pharmacy and Chemistry, now begins to venture in popular periodicals, quite tentatively and modestly feeling its way, perhaps, before embarking largely in the "patent medicine" field.

Most startling of all the appeals are those having to do with body-weight. The promoter of an after-dinner tablet urges his wares and more food with the striking slogan, "I have said good-bye to indigestion: bigger and better lunches." But bigger lunches, hastily eaten, have worked havoc with the digestion of the American business man. That American womanhood passed, during the last five years, through one of those periodic crazes that have afflicted womankind since the world began is not a secret. Indeed, women everywhere began to cultivate sylphlike figures, dieted themselves to the point of destruction; and tuberculosis rates particularly for young girls, rose in many communities. The inevitable result of the serious dieting was to lower the consumption of flour, sugar and other carbohydrates so greatly that persons engaged in those industries became alarmed. Today the millers, the sugar institute, the confectioners, and the manufacturers of cereals are purchasing advertising space to counteract what was for them commercially a serious situation, and what promised to be from the health angle a dangerous situation. Such institutional advertising as is being used by these industries is submitted, before release, to medical authority, and some effort is being made to keep the advertising matter within reasonable bounds. At the same time the manufacturers of Lucky Strike cigarets, having secured, they claim, statements from 20,679 physicians that Lucky Strikes were less irritating than other cigarets, are promulgating a campaign in which they assert that these cigarets do not cut the wind or impair the physical condition, and that "Lucky Strike satisfies the longing for things that make you fat without interfering with a normal appetite for healthful foods." To which the simple reply is made: "Hooy!"

Some women do eat too much; overweight can be controlled by proper dieting, no doubt in the majority of cases. Many people eat too much sugar and gorge on pastry! But the human appetite is a delicate mechanism and the attempt to urge that it be aborted or destroyed by the regular use of tobacco is essentially vicious. A statement by the advertising director of the American Tobacco

Company asserts that the production of cigarets this year will be more than double what it was ten years ago and that the use of cigarets has steadily increased in every year in the last fifteen. He cites among five reasons for the growth of his industry "increasing interest on the part of the medical profession in the social phenomenon of more wide-spread smoking, and the adoption of a more liberal attitude toward the cigarette and its effect upon the human body in the light of these improvements." That the medical attitude has become more liberal toward the smoking of cigarets cannot be gainsaid. There is, however, one aphorism in medicine that is as old as the science itself: "Moderation in all things." Unwarranted, exaggerated, unscientific and dangerous advertising campaigns are not the way to encourage a liberal attitude.

THE TERMS USED IN RADIOLOGY

The subcommittee on nomenclature of the Section on Radiology of the A. M. A. presented their report last June, recommending the use of the following terms:

Radiology: The use of roentgen rays in diagnosis and treatment and of radium in treatment.

Radiologist: One who practices radiology.

Roentgenology (Roentgenologist): The use of roentgen rays for diagnosis only.

Radiotherapy (Radiotherapist): The use of roentgen rays and radium for treatment only. (Roentgen therapy or radium therapy.)

Roentgenogram: A picture made by roentgen rays. (Not "radiogram," as the latter means a message transmitted by radio.)

Roentgenograph (a verb): To take a picture by means of roentgen rays.

Radiation: The radiant energy emitted by the x-ray tube, radium, ultra-violet lamps, etc.

Irradiation: The employment of radiations in therapy.

X-Rays: The energy emitted by an x-ray tube. [The singular form—x-ray—should be used only as an *adjective*—x-ray apparatus—*never* as noun ("The x-ray is useful") or as a verb "x-ray the patient"). It should be written with a small x (roentgen rays with a small (r), except at the beginning of a sentence.] The term roentgen rays is better.

Radon: The emanations of radium, sealed in glass "seeds."

Milligram hours: Applied to radium.

Millicurie hours: Applied to radon.

Implants: Small tubes containing radon, imbedded in the tissues to remain permanently.

COST OF MEDICAL CARE

The American Medical Association has joined with other economic groups to make a careful detailed study of the cost of medical care. The results of this investigation are of great importance to the medical profession. Twenty-five thousand physicians have been selected at random and a very carefully prepared questionnaire on the capital invested in medicine is being mailed to each of them. These questions are to secure data pertaining to the invested capital involved in physician's education, intern training, post-graduate courses, office and traveling equipment, office maintenance, medical society affiliations, library maintenance and medical licensure fees.

Our readers who happen to have been chosen as one of this group will realize at once that this is a survey of the profession, by the profession and for the benefit of the profession. The questionnaire is to be anonymous and there need be no fear of any embarrassing or undesirable results from the information returned. The JOURNAL urges its readers to give serious and thoughtful consideration to this important matter to the end that complete and reliable data may be given on the several items.

This is a gigantic undertaking made possible by the thorough and democratic organization of the American Medical Association and every physician who contributes to the study will be contributing to the advancement of scientific medicine.

Treatment of Mental Diseases by Ringer-Locke Solution.—Steel relates his experience with the treatment of mental cases by regular and repeated injections of Ringer-Locke solution. It has been of definite benefit in cases in which there was a toxic element, and the mental condition seemed to improve more rapidly under this treatment than when "forced" elimination alone was employed. In the debilitated toxic patient, the time which must necessarily elapse before the toxic focus can be attacked is materially shortened. The general paralytic patient in poor bodily health seems to benefit to a very considerable degree; in fact, the treatment is used here with a view to bringing the patient into a suitable condition for tryparsamide medication. In addition, with the bodily improvement there is an increase in the eliminatory powers. So far little difference in habits has been observed. In the "psychologic" insanities little improvement has been noticed from the mental point of view, but even in this difficult class of patients the increased length of sleep and the diminution of restlessness is of considerable advantage both to the patient and to the hospital.

OFFICIAL ANNOUNCEMENTS

PERMANENT COMMITTEES

President Blackburn authorizes the announcement of the appointment of the following committees:

COMMITTEE ON LEGISLATION AND PUBLIC INSTRUCTION

Dr. Irvin Abell, Louisville, Chairman.
 Dr. J. D. Whiteaker, Cannel City.
 Dr. Claude Youtsey, Newport.
 Dr. J. H. Blackburn, President, Ex-officio.
 Dr. A. T. McCormack, Secretary, Ex-officio.

COMMITTEE ON MEDICAL EDUCATION

Dr. W. A. Jenkins, Louisville, Chairman.
 Dr. J. W. Scott, Lexington.
 Dr. J. G. Gaither, Hopkinsville.

COMMITTEE ON HOSPITAL STANDARDIZATION

Dr. J. Garland Sherrill, Louisville, chairman.

Dr. J. M. Salmon, Ashland.
 Dr. J. B. Northcutt, Covington.
 Dr. J. H. Blackburn, President, ex-officio.

COMMITTEE ON CONTROL OF CANCER

Dr. Wallace Frank, Louisville, Chairman.
 Dr. J. W. Stephenson, Ashland.
 Dr. P. H. Stewart, Paducah.
 Dr. H. V. Pennington, London.
 Dr. A. W. Davis, Madisonville.

COMMITTEE ON MEDICAL STUDENTS' LOAN FUND

Dr. Granville S. Hanes, President-elect, Chairman.

Dr. David Barrow, Lexington.
 Dr. Irvin Abell, Louisville.
 Dr. John W. Moore, Louisville.
 Dr. R. E. Smith, Henderson.
 Dr. E. W. Jackson, Paducah.
 Dr. E. S. Moss, Williamsburg.
 Dr. L. H. South, Louisville.

President-elect Hanes authorizes the announcement of the appointment of the following committee:

COMMITTEE ON SCIENTIFIC WORK

Dr. Granville S. Hanes, President-elect, Chairman.

Dr. W. E. Gardner, Louisville.
 Dr. C. W. Hibbitt, Louisville.
 Dr. A. T. McCormack, Louisville.

Blood Changes After Experimental Removal of the Thymus.—After complete thymectomy in guinea-pigs, the erythrocytes decrease in number for a few days. A progressive increase then begins until previous figures are restored. Changes in the leukocytes are less pronounced and less regular, but they usually tend toward a brief, delayed leukopenia. This change is limited to animals more than three months old. This is the time when the growth of the thymus stops.

ORIGINAL ARTICLES

THE LARGER DIAGNOSIS*

By STEWART R. ROBERTS, M. D., Atlanta, Ga.

Probably never before has the value of diagnosis been so accentuated or justified. The addition of instruments of precision and the ability to interpret their findings and revelations has made diagnosis relatively easy where formerly it was clouded or impossible. Where before the diagnosis of a foreign body in the lungs may have been impossible, the broncho scope and the x-ray now make it easy, accurate and prompt. Machines, instruments, chemicals, and a varied apparatus are made, sold, taught and used as "aids to diagnosis." The clinician, ever straining to improve his work may easily be pardoned if he should occasionally wish that no more were to come for ten years that he might the better use and interpret the value of those already in use. It is often said the pendulum has swung too much to diagnosis and thereby blurred the importance of treatment. The importance of being therapeutically minded is an important function of the clinical mind.

The use of the word diagnosis, formerly belonging as a monopoly to medicine, has now become common in all lines of human problems from garages and a broken down car to a corporation that has omitted its dividend or is falling behind last year's per cent of earnings. It is interesting to notice how the word or its idea has become the chief actor in a number of common sayings, such as "my diagnosis," "group diagnosis," "the correct diagnosis," "the diagnosis was wrong," "what is the diagnosis," "what is the matter with me," "he said I had," and "I could not remember all he said, but I have a complication of troubles." The recent graduate seems more sure of his average diagnosis than he does of his average treatment. The ignorant patient who complained of "too much examination and too little treatment" may have expressed some truth. The patient is sent from one doctor to another for "a diagnosis and suggestions for treatment." Certainly what is to real estate in determining its value, diagnosis is to medicine in determining the state of the patient. But the making of a diagnosis is a process of reasoning and is a very complex matter. It is far more than the ability to name the disease or the diseases from which the patient is suffering. "Disease is the sum of the phenomena resulting from the interaction between the organism and various pathogenic influences. Diagnosis

*Read before the Kentucky State Medical Association at Richmond, Sept. 10-13, 1928.

must, therefore, include a consideration of the patient, the pathogenic influences that have been and are at work, and the result of the interaction of these two factors." So variable and variably interacting are these three factors, both in time and degree, that diagnosis is the most difficult field in medicine, and mistakes are frequent. Indeed probability is the real rule of diagnosis and the true guide of the medical life.

With the greater accent on diagnosis and the greater ability to make a diagnosis, even though treatment may have been at times under accented, there has come a better medicine. We have swung away forever from a merely symptom medicine and the treatment of symptoms as an end in itself. So long as there was a drug for every symptom, a complaint for every drug, we remained in the era of observation medicine, the cause of the disease was only a cloud in the sky and research was neglected. And yet one would emphasize the noble debt every clinician owes to observation medicine, and how much there is to see if one really has clinical eyes to see clinical conditions. Even if medicine ultimately becomes a pure science, which is doubtful, it will still be a clinical art. Observation medicine permitted Sydenham to distinguish measles from scarlet fever and his chorea from allied conditions. Observation helped Paget to distinguish his disease of the nipples and of the bones, Heberden his nodes and his angina pectoris, Pott his fracture and his spine. But there they stopped except with such efforts at treatment as were compatible with the vogue of the day. One must know his observation medicine in terms of facts, experience and therapeutics. Only by such knowledge can one make the ordinary diagnoses of somatic or body medicine. One must know that the disease botulism, or sausage poisoning, is a dietary tragedy and introduces itself quickly with diplopia, pharyngeal and laryngeal paralysis, and if fatal, with paralysis of the diaphragm. One should know that tularemia, probably the only disease ever thoroughly worked out from etiology to treatment by an American, declares itself by a fever in one who has handled wild rabbits and other animals, a local sore, swelling of the lymph nodes, a long convalescence, and is proved by agglutination tests in high dilutions. The illustrations could be multiplied in surgery as in appendicitis or a fractured skull; in diseases of the special organs as the eye or the mastoid; and in every specialty. Observation is a wide avenue to the sick man all illuminated by a great white way of symptoms and facts which lead to diagnosis, treatment and cure or at

least to proper management if the patient himself is really studied.

The reality of progress and of the value of research is well illustrated by diphtheria. As long as the cause was unknown, the mortality averaged 40 per cent, and often ranged as high as 60 to 80 per cent. The child was bathed, blistered, bled, vomited, sweated, purged and caustics used in the throat. If he survived the disease and the treatment, it was customary to give the credit to the physician and to the Creator. But original investigation working under the name of research medicine, discovered the specific bacillus which causes the disease and the biological product which cures it, and both symptoms and mortality alike nearly disappear. Preventive medicine steps in and isolate the patient and then produces a Schick who discovers a method by which susceptible children may be immunized.

As a by-product the doctrine of focal infection has resulted in the removal of tonsils and further lessened the danger not only from diphtheria, but from other respiratory infections. Medical research not only gives the etiology and the method of cure, but serves preventive medicine as well. It is the why of medicine, its question mark, and as Horsley well says, "tells us what makes the wheels go round." From it come the great advances in medical knowledge and to it justly belongs the credit. The research mind is a rare gift; it works apart, initiates problems, calls forth criticism, mutters and mumbles and fumbles over its failures, seemingly for a time wastes time with its apparently piddling processes, but always and persistently aims to interpret the language of nature and ultimately succeeds. Blessed by the man who thinks at all; more blessed him who has an original thought, and most blessed of all him to whom is revealed a hidden secret practicable and applicable in the explanation, mitigation and cure of disease. Research and experience have explained tuberculosis; so far they have failed with cancer. Truly in medicine wisdom is better than rubies, no treasure is equal to her. But many are called and few are chosen; many try and only rarely to one is it revealed. Ross, the scientist, discovered the mosquito to be the vector of the malarial parasite, and then Ross, the poet, wrote all exalted and exultant:

"This day relenting God
Hath placed within my hand
A wondrous thing; and God
Be praised. At His command.

"I know this little thing
A myriad men will save.
O death, where is thy sting?

Thy Victory, O Grave?

"Seeking His secret deeds
With tears and toiling breath,
I find thy cunning seeds,
O million murdering death."

Research finds its institutional home in the foundations created for the purpose, but research is also one of the special functions of the teaching clinic. The work done is usually of a very mediocre level and is considered good if it adds a few new facts to science. The ability to do high grade research is a special quality of genius and near genius. There has been only one Ehrlich with the blood, only one Banting with insulin, only one Minot with his liver in pernicious anemia, only Laveran and his malarial parasites, only Beaumont and his opportunity to study digestion in the stomach, only Kendall and Harrington with thyroxin, Lister with his surgery, and the illustrations could be multiplied to the credit of the few, though thousands of good workers have had the spirit of investigation and contributed their part in thought, method and personality to a better medicine.

Very few of us have the time or the ability to do actual research work in the discovery of new facts and the contribution of new cures, causes and methods, but all can develop the power and the habit of thinking through the routine of daily practice in terms of causes, cures and conclusions. The spirit of investigation is sensitive to all the signs, symptoms, facts and personalities of medicine, records them habitually in any case, bears an open mind to every development, has the hormone of medical curiosity, welcomes with warmth all ideas and contributions of value, keeps theory chained until the facts are sharp enough to cut the links of proof, keeps close to the compass of its books and journals, tests all things by experience and gradually and unconsciously develops a quality, possibly greater than observation or research, the ability to interpret facts and conditions as they are.

Too often in the clinical art we see dimly as in a cloud the problem before us, though it is constantly our desire to see face to face the science of the things as they are. It is this power, this quality and this ability to interpret that keep one's feet on the medical ground, makes plain the path of action in the sick room and out of it, and treats the sick man who has the disease rather than just the disease, lights the way to the health worker to prevent disease, sensitizes us to the calm and discriminating reasoning necessary to a diagnosis, or what is yet more difficult, the making of several diagnoses in one patient,

and the separating of that important disease from those others that are unimportant, and then deciding what should and could be done and what should not be done, and all from the viewpoint of the multiple interests of the patient. Interpretation permitted Hippocrates to write his Aphorisms, Galen his text-book that lasted 1500 years, made Osler what he was, is the keen secret of English medicine, the ranking factor in the service of every clinician and clinical institution and in reality is but a clinical vision, which joins the science with the art. Any man can see a lot of facts, but fortunate indeed is the man who knows an important fact when he sees it, and gifted is he who can interpret the many facts about one patient.

The word "diagnosis" is a curious word anyhow. It filters from the Greek into many languages and literally means "to know between," "to distinguish," or "to discern." It involves the ability to make any discrimination whether medical or otherwise, and includes the qualities of definition, description, and decision into definite name and classification: It takes into consideration groups of facts and reaches a conclusion in harmony with the facts presented. The relation of a medical student to diagnosis illustrates the larger meaning of the word. To make a correct diagnosis is his chief intellectual hope. His first two years in medicine are spent in studying the normal body, its structure, development, functions and chemistry: the second two years he studies the abnormal body in terms of the diseases which affect mankind.

After graduation and his hospital life, he gradually discovers that sick people, their families and friends, differ greatly one from another in their primitive feelings, their reaction and resistance to bodily disease and pain in the control of the emotions in the strength and weakness of an intangible spiritual life, in their response to suggestions, requests and demands, and above all he is frequently sadly impressed with his inability to manage and influence them, as he believes, for their own interests. A new problem has arisen, instead of facing a disease and making a diagnosis as outlined in a text-book, he is facing a personality. He is facing a reality, which is named personality, and this personality has a body that is sick; or worse yet, this personality has a body that appears well from a thorough physical examination, but the owner complains apparently honestly that he is sick; or worst still, the body is admitted to be well, but the personality has changed, the mind is sick, and the family looks yearningly and vainly for someone to minister unto a mind diseased. But one of his chiefs walks through the hospital and

seemingly, without effort, understands the single patient as a whole, the diseases of his body, the play of his mind, the swing of his spirit. This clinician seems to have a peculiar power in the sick room. As was said of Weir Mitchell, "he has the uncanny ability to make sick people well; he gives drugs or the knife to the body, and whatever else the body needs; cheer and the proper degree of knowledge to the mind; faith, serenity and contentment to the spirit." And then it begins to appear in a big way that the patient after all is a "personality," with a body that is but a vulgar fraction of the whole and that this body is definitely influenced through the mind and spirit for good or ill. Patients are people anyhow. They are like Goethe when he said, "All your ideals shall not prevent me from being genuine, and good and bad—like Nature!" The interne comes disappointingly to realize that these gifts cannot be imparted from one clinician to another except imperfectly. With all his clinical wisdom, each man for himself must get also clinical understanding, partly by inheritance and native gifts, partly by training and experience, and partly by spiritual power and human sympathy, for the clinician must have a soul.

Progress in medicine will necessarily continue. Growth, economics and efficiency are ever increasing forces in modern life. In this generation we have come from slowly moving and easily tiring legs to engines that make wheels turn fast and now to still faster moving wings. As Babson recently wrote, "We must forget the slowly moving past—opportunity lies in the fast moving future." There is an insistent and too often an inarticulate demand for growth in medicine from the viewpoint of the personality and the patient as a whole. A hundred years ago Cuvier said, "The nervous system is at bottom the whole animal, other systems exist to protect it, to nourish it, to cleanse it." The circulation, the respiration and the digestion are relatively stable as are the renal and muscular systems. The nervous system is relatively unstable. Who of us at some time in our lives and with most of us, frequently, has not been the victim of his own nerves or of someone else's nerves? We consider that man most fortunate who in the midst of a busy life, possesses a mind that will lie down with his body when he seeks rest. How often have you said to your mind, "Peace, be still," and it would not. How often is it said of one person that he or she is temperamental; of another fretful; of another high-tempered; or another emotional; of another lacking in self-control; of another lacking in will-power; and of a last, lacking in

poise and balance. We medical men use the words neurosis and neurotic, and the surgeons say such people are "hipped," and "it is too bad you can't cut it out." And woe be unto that doctor if he tell the patient, particularly if the patient be the female of the species, who is said to be more deadly than the male, that "it is all in the imagination."

Each of us as an average, normal individual, is a unit of mind and body with a spirit or soul that we call a "personality." A personality is an intimate union of body and mind with a control lever which is spirit. The spirit of a man is that force in his life which gives a unified direction to all his days and deeds. A personality is not only something that we are born with, but it is something we have developed into and acquired either consciously or unconsciously, the combined result of heredity, environment, circumstances, education, emotion, disease, trauma either physical or mental, rewards and punishments, training and natural gifts or the lack of either or both. The brain is the physical basis of the mind,—no brain, no mind. The mind part of the brain, the cortex, is made up of nearly a billion neurons whose chief function is mind with its reason, logic, speech, memory, consciousness and superb and specific skill. There is no divorce possible between the cells of the brain and the ways of the mind. The mind is simply the physiology of the brain and we call this special physiology, "psychology." When we deal with the mind, as Meyer long ago pointed out, we are dealing with psychobiology and not with any separation of the mind from the body, nor can we contrast mind and body. How the relation works we do not know, but we do know that it is an intimate relation and that it does work.

The older clinician and family physician was above all things a clinical psychologist and a behaviorist long before the term was accented by modern psychology. He knew the behavior of his patients in their trials, troubles, fears, faiths, failures, in their periods of triumph and disaster, and in their civic, domestic, economic and matrimonial problems. He had time and took time to listen to their woes and problems. To talk to him was to benefit from a catharsis of emotion, instinct, mind and spirit as scientific and often more helpful and sympathetic than some of the efforts in analysis of today. The late Francis Peabody of Harvard, wrote on "The Care of the Patient" and wisely emphasized functional capacity as a limitation problem in internal medicine. If one were always adequate to the fancied or even to the actual demands of life no doubt many of the neuroses would be avoided. And in current life it is so easy to

outreach one's ability, much less one's ambition. The older idea concerned itself with perverted function based on anatomic or structural disease, but function can be easily disturbed by emotional strain with or without anatomic disease. Mind and the emotions are as much a function of the brain as digestion is of the alimentary tract. The motions are just as much a part of the range of the nervous system as is pain. Fear, hunger and lust are primary and primitive things that arise in their might as naturally as night follows day.

The mulatto woman of 33, the worn mother of eight children, brought from the country to the hospital suffering with an acute abdomen, was being examined. The physician asked for a tooth pick or a nail file, intending to take her abdominal reflexes. The patient misunderstood and thought a knife was asked for with the usual purpose in mind. Suddenly her eye balls stood forth, her pupils dilated, the body stiffened, the skin of the abdomen became quickly a goose skin, violent mass peristalsis of the colon became plainly visible through the abdominal wall, and loud borborygmi were heard. She was sick and ignorant, a stranger fearful of an operation, and in an instant fear produced a series of reactions. Berry classifies the chief emotions as anger, sorrow, fear and joy; the passions as fury, anguish, terror and hilarity; the moods as chagrin, gloom anxiety and happiness. There are individuals with stable emotions, others very unstable, and all degrees between. Ramsey the great Charleston physician and historian was suddenly killed in front of his door by a lunatic, and a year after his untimely and tragic death his widow wrote a friend, "I am sad of mind and weak of body." Grief had done its perfect work. During the Civil War bereaved families by common consent refrained from wearing mourning because of its benumbing effects upon the general public, which illustrates the power of suggestion and admits that the state of the mind has much to do with the state of the body. As a man thinketh and feelth, so is he. And general medicine more and more is taking his thoughts and feelings under its wings, for not to do so is for it to remain only a medicine of the body and to avoid a larger opportunity and a nobler service. A cheerful heart is good medicine and there is no better therapeutics than happiness.

A woman of three children by a former husband, consulted a diagnostician for complaints of "nervousness, weakness and indigestion." These three problems may mean much or little in terms of diagnosis. Apparently she was considered solely a problem of soma-

tic medicine and all the ways and instruments of medical science were used to solve the problem. The work done was splendid, including numerous and expensive laboratory tests; many x-rays; the physical examinations were searching; even the calcium content of the blood was studied and yet there were no symptoms of tetany. The diagnostician was puzzled and the patient dissatisfied. He thought she was just neurotic and she thought she needed another doctor. The new doctor saw nothing to examine and nothing to test; the examinations and the tests had been made. They had revealed nothing abnormal. The patient was as a soldier after drill—"as you were." It is a fairly safe diagnostic risk to assume, if a patient has been thoroughly studied and carefully treated and is no better, that at least one of five conditions prevails: (1) The case is incurable; (2) The diagnosis is wrong; (3) The treatment is wrong; (4) The patient has not followed directions; (5) A functional problem has been overlooked. The story of this particular woman, when the question of the emotions, happiness and adaptation was raised, was very simple. "My first husband was a perfect man of heart, mind and finances. My second husband is a good man, but so careless financially that for ten years I have tried to make him over financially so he would be like my first husband. I can't make him over, he won't try. I have failed and I love him still." She had struggled to adapt herself to her present environment and failed. Her complaints were but the functional upsets of this situation.

These struggles come to us all in one way or another. Some of us are easily adapted to circumstances and to environment and some with great difficulty, some of us change the environment, some of us outreach our abilities, some of us are inadequate and some of us definitely fail. Every struggle takes something out of us, something physical, mental or spiritual. An overdraft on one's nerve force is worse than an overdraft on one's bank account. The prolonged strain, and more acutely the prolonged overstrain of the mind, instincts and emotions ultimately results in exhaustion of the nervous system in varying degrees with the natural upset of habits of thought and body functions. Patients so involved are already inadequate and need above all a clinician with a large clinical soul who has both science and common sense, understanding and wisdom, and a very wide vision and experience with life and spirit. Science is not equal to all the problems of this kind, and neither is the spirit. All the resources of life and medicine are sometimes necessary.

The second story is like unto the first and

illustrates multiple conditions in the life of a young married woman which in turn made demands upon her physical, mental and emotional resources. There were three in the family, Kipling's "'im, 'er and 'it.'" In June and in August she had her first and second attacks of mucous colitis. There was in attendant a splendid somatic doctor who gave her much medicine and more rest, according to the dictates of a routine therapy. She was left with a physical weakness not hitherto experienced and the fear of a third attack. Mucous colitis is mucous colitis, but it may also be a physical expression of the emotions in terms of pathology. Why should a young married woman all at once in the perfect month of June have an attack of mucous colitis? Again a problem of function and environment, a tapping of her emotions and the clinical cat jumped out of the diagnostic bag. "Well, doctor, you see, since you ask me, I have been worried. It was our first trouble. My husband had a good position and we were putting aside a little every month, buying our home and were very happy with the baby. And then my husband's firm failed. He lost his position, our savings were rapidly used up, for he was out of work for four months, and we went to his mother's to live. Then on top of all that the baby was sick, then my husband was sick and I nursed them both and really have just worked and worried for eight months." One queries in his scientific mind—would this poor little woman ever have had mucous colitis had it not been for this realistic and materialistic repertoire of life. Someone has said that "hurry is the square of work and worry its cube." Walton asks "Why worry?" But who can help it. Osler said "live one day at a time by dividing life into day-tight compartments," but one asks "Who does," or "Who can." Inner contentment attained only by a spiritual strength, associated with a resolute mind and a strong body, is a trio of prevention against inadequacy to environment, the evils of an exhaustion and the pangs of a neurosis.

The annual physical examination is recommended as an aid toward the prevention of disease, the detection of disease in its beginning, and perhaps the resultant prolongation of life. The physical examination takes account only of the body and rather neglects that larger sphere of mind and body. Smith at the Ford Hospital in Detroit believes that fully twenty-five per cent of the patients in the general hospital have need of a psychic investigation and this is probably a conservative estimate. The older man with long experience, can usually quickly enter into these psychic realms and know their reactions. The younger man lacks the broadening influence

of life's deepest experiences and has until he himself has suffered, unless he be naturally gifted with the rich milk of human nature, neither tact, talent nor inclination to enter intimately and sympathetically into the deeper ways of life. It is so difficult in the individual patient to remember that the emotional experiences of life do affect the entire constitution and the functions of the different organs. It is still more difficult, often impossible, to remove the cause of the emotional strain, simplify the dissipation of the emotions and let adequacy smoothly succeed inadequacy. We speak glibly of nervous diarrhea and nervous dyspepsia and nervous dyspnea, but nervous constipation is probably far more frequent. High blood pressure is probably in the beginning very often an upset of the neuro circulatory mechanism due to lack of habitual calmness. The state of mind may, within limits, determine the blood pressure. And apart from disease, of which low blood pressure may be a symptom, hypotension may be an expression of constitutional calmness. Undue emotion in diabetes may further upset the carbohydrate metabolism. The use of the emotions is hard work.

The Epicurean woman who in the home made her desires of dress, rest and comfort paramount to duty and cooperation ultimately became a selfish neurasthenic with complaints telephoned from all the viscera. Service may breed exhaustion, but selfishness breeds a neurosis curable only by a spiritual revolution from within. A woman who had lost her three children and her husband and at 54, was alone, save for interested friends, and said that a simple fall on the waxed floor was the straw that broke the camel's back of interest and hope in life. The young man petted by indulgent parents from his cradle, after his own marriage and the birth of his baby, with the least responsibility was so inadequate to his environment that he slumped into a laborious and complaining inertia and consulted many doctors for "nervous troubles."

The physical examination is only part of the examination. The story of the viscera is only part of the story. The patient presents himself not only with his body, but as the mental and emotional mould of all the experiences of his life. We demand of our patients certain spiritual qualities as faith, trust, cooperation, patience, courage, and above all, self-control. The turmoil of their souls should at least be taken into consideration in the assessment of a diagnosis. But the patient too must make a larger diagnosis of life. "Ye must be born of the spirit," is well for each of us. Life is a combination of the tangible and the intangible and sooner or later every one must draw on such spiritual

reserve as he has laid by.

The two natures of man are strange creatures and from them come many an offspring that inhabit the psychic and emotional world and cry continually for recognition. As Plato expresses it, "Righteousness consists in so strengthening the man within that he may govern the many-headed monster." The individual must determine whether the man or beast reigns. Patients are more than mere bodies, suffering more than just pain and grief more than loss. We are more than doctors of the body and the clergy has no monopoly on things of the spirit. Our patients may be in body protoplasm like a worm of the dust, but in mood and manner they are "created a little lower than the Angels." The larger diagnosis considers the whole of man and ministers to his every need, remembering that the ideal is

"The flawless symmetry of man,
The poise of heart and mind.

HYPERTENSION*

By C. C. TURNER, M.D., Glasgow.

In presenting this subject no claim is made for original or research work, only an earnest effort to compile the thought of some of the best authors of our day, trying to decide for myself whether there is an "Essential Hypertension." In the study of the twenty-eight cases, sixteen males and twelve females, twenty-six whites and two colored, extending over a period of several months, none but the well known laboratory tests have been employed.

We understand the word hypertension to mean a condition in which the blood pressure rises above the normal as determined not only by palpating the radials, but by a sphygmomanometer which for all practical purposes measures the interarterial tension fairly accurately.

The systolic varies from 120 mm. Hg. in young adults to 150 or 160 mm. in middle age and over, the diastolic from 70 to 90 mm. varying with age and sex, being slightly lower in the female than in the male of the same age. The difference between the systolic and diastolic is known as the pulse pressure or differential pressure. The average pulse pressure is 40 to 45 mm. which increases 1 mm. every two years from the ages of forty to sixty, and 2mm. each year thereafter. Pressures higher than the above may be of no ill omen, but warrant frequent observations. A rise in diastolic is more significant than is that in the systolic as it indicates the condition of the large arteries.

There are many factors which produce

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temporary changes in the pressure, e. g., acute illnesses, physical and emotional disturbances, but for the purpose of this discussion none but the chronic forms will be considered. I shall further narrow the subject by omitting the syphilitic and thyroid types, considering only the renal and hyperpiesia.

Until the last decade a patient presenting a high blood pressure suggested either a kidney lesion or arteriosclerosis. Recently, Sir Clifford Allbutt, and others, recognized a hypertension separate and apart from these and called it Hyperpiesia, or Essential Hypertension the cause of which is unknown. This, to my mind, is one of the greatest contributions to medicine in the past generation since hyperpiesia is responsible in one way or another for more deaths in the United States than cancer and tuberculosis combined and its incidence is on the increase.

There are many theories advanced as to its cause. Probably the most widely accepted is that it belongs to the allergic group of diseases, that it is due to a warp or metabolism produced by an ergot-like poison circulating in the blood producing a spasmodic contraction of the capillaries through a vasomotor stimulation in the medulla similar to asthma. It also appears to be an hereditary thing. As in many other instances the malady itself may not be inherited, but a predisposition by virtue of an inferior grade of arteries or a hypersensitive nervous system may be inherited.

It is a well known fact that people of uncivilized countries and the Chinese are practically free from it, while as stated above, it is on the increase in the United States, especially among the so-called better classes. Business executives, doctors, lawyers, and others who are active mentally and who get but little outdoor exercise are especially susceptible to it. However, it is often found in the laboring classes.

Symptoms: Given a patient with pressure of systolic 210 mm. and diastolic 160 mm. how will the physician determine to which group it belongs? At present some authors still believe that all hypertension has for its underlying cause a diseased kidney. This is rather hard to believe in the face of the fact that many cases of hypertension have gone on to fatal issues whose renal function, urine, and nitrogen content of the blood remained normal or practically so to the end, and whose kidneys showed no signs of disease at autopsy.

All are familiar with the different types and their respective symptoms. Renal hypertension may occur at any age. In it there are puffiness about the eyes, irritability of temper, constant headaches, increasing pallor, anorexia, impoverishment of the blood, drowsiness, languor, etc. Whereas the hyperpiesic is usually middle aged or over, of stocky

build, ruddy faced, active, alert, and free from all uremic symptoms. In fact, in the beginning there are no symptoms. Often the patient comes for some other malady or for insurance examination and the hypertension is thus discovered. (One of my cases came because of severe epistaxis.) On inquiry the patient gives a history of a feeling of unusual well-being. He looks strong and full of life and has had nothing referable to the heart, blood vessels, or kidneys, and except for this casual examination probably he would have gone on through a long and useful life without even suspecting a high blood pressure.

In most cases symptoms referable to the heart, such as panting on the hills, tightness in the left chest, palpitation, headache, dizziness, irritability and other nervous manifestations soon appear, at which time the left ventricle may be hypertrophied. These are late symptoms. It is remarkable how long the heart holds its own even in spite of very high pressures in hyperpiesia, while in acute nephritis hypertrophy of the left ventricle frequently appears within a few weeks. This summer I saw an eighteen year old lad whose left ventricle was two fingers to the left of the nipple line four weeks after the onset of acute nephritis. However, it finally weakens and all the symptoms of heart failure appear and the patient passes out of the picture as a result thereof. Heart failure is the most common termination of hyperpiesia. Second to this are the pathological changes of the blood vessels. These generally take place in patches and on the location of these depends the prognosis. If in the splanchnic or superficial vessels very little happens. But, if in the coronary, cerebral, or renal, the outlook is serious indeed.

The story of renal disease is too well known and requires too much space to warrant repeating here.

Eye Symptoms: Every general practitioner should possess an ophthalmoscope and familiarize himself with the normal eye grounds. He can thus readily recognize any variation therefrom. If it presents a neuroretinitis, then the chances are you are dealing with a kidney condition. While a hemorrhage of the retina points to a kidney lesion, yet they do occur in hyperpiesia. The retinal picture is not only one of the most valuable symptoms in differential diagnosis, but it also is a valuable prognostic sign in that it furnishes the best possible evidence of the condition of the cerebral vessels.

Diagnosis: In arriving at a differential diagnosis in the small series that I have studied the following laboratory tests have been employed routinely. These are all well-known and can be found in any good book on labora-

tory technique. Some of them are simple and require no special skill or equipment, others require both special training and equipment.

Tests for Kidney Function: (1) Twenty-four hour specimen of urine for quantity and specific gravity. (2) Urine tested for albumin and granular casts. Albumin graded. +, ++, +++, and +++++. (3) Phenol-sulphonephthalein by the intra-muscular method. (4) Concentration test. (5) Dilution or "water" test.

Blood Tests: (1) Wasserman. (2) Hemoglobin content. (3) Red blood corpuscle count. (4) Non protein nitrogen. (5) Urea nitrogen. (6) Uric acid. (7) Basal metabolic rate. This last was made in a limited number of cases only.

Prognosis: The prognosis, as has been suggested above, depends more upon the condition of the heart and its vessels, the kidney and the cerebral vessels, than upon the height of the pressure. A diastolic of 100 mm. or more is of serious import. Barring disease of these vital organs the patient may live out his expectancy practically free from symptoms. In fact, some of the greatest feats have been performed by men afflicted with this malady who became invalids only after they were told of their condition.

Then too, this being a familiar disease, a history of the patient's forebears, brothers and sisters, serves as a guide to prognosis. If these give a history of cerebral hemorrhage, angina, or cardiac or kidney breakdown, then it is a very good bet that your patient will suffer the same disaster. And the same reasoning holds true in case the family history is that of milder symptoms. As in many other diseases there is no doubt that there are different grades of it, some cases being more malignant than others. Naturally the prognosis is brighter in the milder than in the more severe forms. A response to treatment usually indicates a mild or non-malignant form of the disease. Like diabetes, the younger the patient is, the more unfavorable is the prognosis.

Treatment: Having made a diagnosis of essential hypertension, what shall we do about it? Very little, I fear. Prophylactic treatment is ruled out in most cases by the very nature of the onset. Coming on stealthily as it does the system just as insidiously adapts itself to the change so that there are no symptoms until late in the course of the disease when the patient presents himself because of shortness of breath, dizziness, headache, a halt in the speech, slurring of a foot, or temporary loss of the use of an arm or hand, with pressure say 220 mm. systolic and 110 mm. diastolic. Your patient then has entered the last and not the first stage of the

disease, and to try to reduce such a pressure to normal limits would be a fruitless task and pure nonsense, if not even harmful to the patient.

There are many measures used looking toward making the patient more comfortable and prolonging life, the most effective of which are limitation of activity, regular habits of living, rest, removal of foci of infection, hot baths, luminal and the nitrates, and reduction of weight. The best results have been obtained in the obese.

The pressure should not be taken oftener than safety demands and the reading should not be made known to the patient. Neither should too much treatment be given, since all are constant reminders of a serious incurable malady made all the more serious by introspection.

CONCLUSIONS: 1. There is an hypertension not attributable to any known kidney disease.

2. The cause of essential hypertension is unknown.

3. Essential hypertension is much more common than the average general practitioner thinks.

4. The sphygmomanometer is the most valuable means of diagnosing hypertension and should be employed more routinely.

5. The diastolic is more important than the systolic.

6. Many cases of so-called "heart disease" are due to essential hypertension.

7. Heart failure or heart defeat is the most common cause of death in essential hypertension and second to this is cerebral hemorrhage and kidney breakdown.

8. Many patients go through life in happy ignorance of the presence of this malady.

9. Treatment affords temporary relief only.

10. Measures employed causing the sufferer to become solicitous about himself do more harm than good.

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DISCUSSION

P. C. Saunders, Danville: When the committee asked me a few days ago if I would not discuss Dr. Turner's paper on hypertension, the first thought that came to my mind was this: Way back years ago when Dr. Turner and I were serving our four years together in this work, at our semi-annual quiz, preparing for the examination, it was his delight always to ask the hardest question that he could put, at the same time knowing that none of the professors had nerve enough to ask even a senior such a question as that. When I saw the subject that he was assigned, hypertension, it reminded me of just what he is usually accustomed to doing, digging down for the very hardest things he could think of.

A few years ago about the only time when I would take a blood pressure was during a life insurance examination. I have learned something more since that time, but I am reserving the right to take back anything that I say concerning Dr. Turner's paper till next year. Dr. Hanes has changed his ideas on diseases of the rectum every year since I have known him. If Dr. Bill Jenkins had read a paper on hypertension five years ago and would read one today, you would not know it was the same subject even. Whatever I say I want to reserve the right to retract and tell you something else this time next year, if I am living.

Seriously, I want to congratulate my friend, Dr. Turner, on his excellent paper. Evidently, he has been doing a little work outside of his regular practice.

I believe there is an essential hypertension. I may not agree with him as to the frequency of it, but I really do believe there are some high blood pressures of which we do not know the cause.

In the essential hypertension, I think that in our swinging of the pendulum in regard to heredity, we have let it swing just a little too far, and I think the great majority of these essential hypertension are really due to heredity and to the make-up of the individual case.

This paper has done one thing for me. It is going to make me know more about hypertension. I will know more about the blood pressure

in the future than I have known in the past. I am going to try to make a closer study of it in the future. Dr. Turner's paper is the cause of it.

Virgil Simpson, Louisville: Dr. Turner has elected to limit the scope of his paper to a discussion of a high blood pressure, on the one hand, which he recognizes as caused by kidney diseases, and, on the other of a high blood pressure, of which there is yet no recognizable cause. I think we are all at one so far as the high blood pressures incident to kidney involvements are concerned. They have been sufficiently long recognized, their clinical course has been charted and the termination is uniform. It is to the question of essential hypertension, as he denominates it, that I am pleased to direct my attention.

That there is a group of high blood pressures without demonstrable etiological pathology is indisputable. The first question that confronts one in considering such a problem is, what is meant by high blood pressure? In other words, what range of figures does one recognize as being within normal limits of blood pressures and beyond which one may say a patient has a hypertension? That is a very variable element. Particularly is that true with regard to the systolic pressure, the pressure recognized when the heart is at work. That varies so much with factors that change from time to time in the same individual that it is, as the essayist has said, of less importance than are the readings of blood pressures when the heart is at rest, or the diastolic pressure.

Recency of meal, exercise, emotional disturbances and other factors materially affect the systolic pressure, and within rather wide range. A pressure in an individual of 160, who is forty years of age, could not, in my judgment, be termed hypertension, unless there go with such findings other things which would substantiate such a suspicion. One such finding is a high diastolic reading as has been said. A higher systolic pressure than is usual in an individual of given age with a normal diastolic pressure is certainly not any kind of hypertension other than a transitory type of systolic hypertension. One must be careful in the classification of these individuals, because it means considerable to them. To take a man or woman having problems, economic and otherwise, and materially restrict their activities on the basis of a determination that his blood pressure is beyond what we consider to be normal limits is a serious problem.

In the second place, I would say that in our election to classify this group of hypertensions as essential hypertensions, we are confronted with the possibility that we are offering to the profession-at-large an easy escape in the matter of diagnostic study. It is much easier to say, after a cursory examination, this is an essential

hypertension, and so manage it, than it would be to dig down beneath the surface and try to uncover some ascertainable cause of the high pressure.

Therefore, the term essential hypertension carries with it some potentiality of both therapeutic and diagnostic harm, because if we are content thus to permit ourselves to so label this rather large group of higher blood pressures than we consider to be normal, we are encouraging a degree of inactivity on our part in trying rather than an honest effort to determine whether or not this patient has some real thing which is causing the high blood pressure.

I am further persuaded that after the most careful diagnostic study, where the kidney, the thyroid, and other structures have been found, so far as we can determine, to be acting within normal physiological limits, the group of cases that we call now essential hypertension will, in the future, be divided and sub-divided until there will be but small justification left to call such cases true essential hypertensions. I am persuaded that a high blood pressure means something and whether or not we are able to discover that something is of little moment so far as our classification is concerned, and that the time will come when we will be able to decrease materially the limitation of this term that now is occupying a rather large place in our literature. Until such time I would propose the classification

(a) Hypertension with ascertainable cause (naming it.)

(b) Hypertension without ascertainable cause.

J. W. Scott, Lexington: I want to discuss briefly the effect of hypertension on the heart. I think it has been demonstrated by Claussen, of Minneapolis, with minor exceptions unimportant in this connection that there is no such thing as myocarditis that is, myocardial fibrosis except as it exists in direct relation to coronary sclerosis. Therefore, these patients who have hypertension do not have myocardial disease as the result of breaking down of the myocardium under the strain of hypertension. The cardiac failure of the hypertensive individual is not that of myocardial disease, essentially. The heart muscle has given way under strain, just as any other muscle, which has borne a long continued strain gives way.

This has been emphasized just recently, within the last month, I think in a paper by Henry A. Christian, published in the Journal of the American Medical Association, in which he calls attention to the fact that hearts of these patients having died of heart failure following hypertensive disease, do not show any pathological change at all.

One word as to treatment of heart failure in hypertension. It seems to me heart failure in

essential hypertension should be treated just as heart failure that occurs without hypertension; in short that congestive cardiac failure caused by hypertension must be treated just as congestive cardiac failure from any other cause, and that has the same important role in this as it has in an all other congestive cardiac failure.

As to the care of these patients generally, I think it should be emphasized that while the prescribed physical rest can always be attained, that is, aside from economic conditions which prohibit it, it is impossible by order, by fiat so to speak, to put a man's mind at rest. The mental state is not responsive to the physician's orders. The patient can be put to bed however. It has been suggested, and it is my practice, to put these patients to bed at stated intervals, spending a week-end, three nights and two days, in bed, say every third week. If the hypertension is severe, they are put to bed for a week once a month or once in six weeks. I believe that is a real resource in the treatment of these patients.

There is one minor point as to determining blood pressure. I believe that a good many blood pressures are inaccurately read. It is my experience that the patient often makes an almost involuntary contraction of the biceps under the compressing cuff. I do not refer to an obvious clenching of the fist, but to a contraction which is apt to escape observation. Upon telling the patient to relax, I have often seen the mercury drop ten or fifteen millimeters, and the systolic pressure will be found to be at the lower level.

R. R. Elmore, Louisville: I wish to touch on four phases of hypertension, the first relating to classification.

Undoubtedly, the term, essential hypertension, is a term which is confusing. Whether the early tension is due to an increase in the peripheral arterial resistance following some toxemia,—developments of the future will determine. Unquestionably, the number of cases of essential hypertension are far greater than they should be.

There are three phases in relation to the treatment that is to symptomatic treatment. Of course, treating these cases is a symptomatic treatment. The first is in relation to venesection. Venesection in types of patients with pounding, throbbing headache will frequently give a good deal of relief. This venesection should be cautiously done. If too much blood is taken off, the patient will have miniature surgical shock, which will take them some weeks to recover from. It is inadvisable to take over six to eight ounces at first. Subsequent venesection can be adjusted according to the reaction of the patient. These venesections can be done at intervals of two to four months, as a

rule.

The second feature of the treatment is the use of sodium iodid intravenously. These cases, as a rule, show a pretty high viscosity of the blood. It has been well established that sodium iodid is an excellent remedy to diminish the drag of the blood stream on the vessels. Given in small doses, once or twice a week, it is of considerable value.

The third feature is the use of potassium sulphocyanate. During the past summer, I attended Dr. Joslyn's Clinic at Peter Bent Brigham in Boston, which was conducted by one of his assistants, and I asked him if he ever used this at Peter Bent Brigham. He said they were not using it at the present time, that they had used some of it and their conclusion was that it had developed a nephritis and they had one or two fatalities which they thought had been hastened, if not induced, by the use of the potassium sulphocyanide.

That has not been my experience. It is my custom, in these cases where I think a remedy of that character may be of some value, to prescribe a grain and a half in a solution of water, three times a day for two or three weeks, and then ask the patient to continue it once a day or once every other day, for a long period after that. That has given symptomatic relief to some of the patients under my observation.

C. W. Dowden, Louisville: I like Dr. Turner's paper very much. I feel that in order to get its true worth and value, one needs to sit down and study it carefully for about an hour.

In regard to the essential hypertension particularly, or the hyperpiesia, I feel that it is not so much a question of what we do not know about the disease as it is knowing so much that is not true. The literature has been flooded for the last decade with various treatments and various explanations for the hyperpiesia or essential hypertension, and we are beginning to find out now that much of this that we have been taught is not true.

For instance, we were taught for a long time that a salt-free diet was very important in controlling these diseases. Possibly it does have some effect, but, in the main, we know that it has very little to do with the control of these conditions. We were taught that obesity was important. I am not ready to admit that it does not have something to do with it, but, in all probability, if it is influenced at all by obesity, it is through additional work placed upon the heart. Red meat, eggs, a high protein type of diet, certainly has no bearing upon the question at all. The menopause, possibly. It is true that a few women go through a period of life at which time they have a rise of blood pressure, but, on the other hand, there are thousands of women who go through the menopause and do

not have high blood pressure, so it seems the association is a little far fetched.

A point that I feel needs more stressing is in regard to treatment. If we would know how to treat any disease, and particularly hypertension, we must study that disease from its very beginning. It has been determined that this disease does frequently begin in early childhood. If we could take those children, as has been done in certain sections, and change their environments, change their habits of living, and change their future, something might be accomplished. In a general way, medicine, diet, and so forth, do very little good. If you can take the patient, unburden him of the load that he is carrying, which is usually mental, and take time to explain that this mental strain is more injurious even than physical strain; convince him and especially if he is over forty-five, that if he wants to live and control his hypertension (not cure it), he must change his habits of living. In other words, it is important to teach our patients the art of living—oftentimes a very difficult thing to do, but certainly well worth while.

CONSIDERATION OF PELVIC INFLAMMATORY DISEASE*

By ELMER L. HENDERSON, M. D., F. A. C. S.,
Louisville.

Despite the fact that there have been volumes written on this subject, the treatment of pelvic infection has not yet been satisfactorily standardized. Particularly is this true in those cases where the origin is traceable to the most frequent and important etiological factors, namely: (1) pyogenic infection following abortion or childbirth, and (2) infection due to invasion of the gonococcus of Neisser. In this paper these types only will be considered, although it is well recognized that pelvic inflammatory disease is sometimes the result of other forms of bacterial invasion.

The reminder seems pertinent at the outset that, in pelvic infection from the causes specified, migration of the infective micro-organisms is almost invariably from without inward through the medium of tissue continuity; that is to say, along the vaginal, cervical and uterine mucosal surfaces.

Following abortion or childbirth the cervical and uterine mucosa may be simultaneously involved, whereas in gonococcal infection the micro-organisms primarily invade the urethral, vaginal or cervical mucosa, and thence migrate to the deeper structures.

Insofar as concerns the oviducts and ovar-

ies, rarely are the infecting agents transported thither by the blood or lymph stream. However, in other forms of pelvic inflammatory disease, originating in foci of infection existing elsewhere in the body, dissemination probably often occurs through one or both of the latter routes.

Pelvic inflammatory disease resulting from the causes here considered constitutes the most dangerous form of pelvic infection. While the morphological types and the etiological factors may be essentially different, yet the resulting pathology, the accompanying symptomatology, and the therapeutic indications, are so nearly identical that little reason exists for detailed separate consideration in a paper of this character and scope.

In pelvic infection the gonococcus is culpable in the proportion of probably more than ten to one as compared with other bacteria. The observation is interesting, in this connection, that during the last few years there has been a decided increase in sexual promiscuity and the incidence of gonococcal infection, particularly among the more youthful of the female sex, and therefore a greater number of young women have suffered from the complications and sequelae of the disease, including both acute and chronic pelvic inflammations. As the logical result of greater sexual promiscuity there has also been noted an increase in the number of abortions, induced and otherwise, followed by pelvic infection.

Notwithstanding the perfected technique of modern obstetric procedures, the supervision of infection after childbirth is inevitable in a minimal number of instances. Excluding cases due to gonococcal infection, however, abortion is responsible for the greater proportion of cases of pelvic inflammatory disease. Whether involvement of the pelvic organs be due to gonococcal infection, or infection following abortion or parturition, the resulting pathology for the most part is identical.

It has been asserted by numerous authorities that, during the upward migration of the gonococcus from its primary urethral or vulval situs, the vagina, cervix and uterus escape infection, yet when the organisms reach the oviducts the most intense mucosal infection ensues. The apparent basis for this theory is that the acid vaginal excretions are lethal to the gonococcus. It is quite obvious that, if this were true, none of the germs would ever reach the oviducts, since they would be destroyed in the vagina. Furthermore, invasion of the gonococcus often incites vaginitis, cervicitis and endometritis prior to the development of adnexal infection. This

*Read before the Kentucky State Medical Association at Richmond, Sept. 10-13, 1928.

is a matter of common observation and seems to discredit the theory mentioned. Since pelvic inflammation from infection following abortion or childbirth is generally the result of intracervical or intrauterine instrumentation, the vagina may or may not be involved in the infective process. The ordinary pathogenic micro-organisms are usually responsible for the infection.

Irrespective of the type of infection, as already intimated, the pelvic pathology is practically identical. During the acute stage, in which the oviducts only are involved, there is intense mucosal congestion, inflammatory reaction, swelling and tumefaction, i. e., the logical results of micro-organismic invasion. The infection soon extends to the oviducal muscle and peritoneum, the tissues become hyperemic, edematous, and there occurs marked increase in exudation. The ovaries do not long escape the extension of the infective process. Oviducal leakage, followed by pelvic peritonitis, may eventuate at any time.

The chronic stage is marked by more numerous and diversified pathologic changes. By contiguity the inflammatory process extends to the adjacent viscera causing agglutination and later the formation of dense organized adhesions; the oviducts and ovaries generally become involved in their entirety; the oviducts are greatly enlarged, distended, tortuous; when both proximal and distal ostia are occluded there develops the so-called hydrosalpinx, hematosalpinx or pyosalpinx, often abscess formation. As the logical result of extensive organized adhesions, in some instances the oviducts, ovaries, uterus and pelvic peritoneum have been found firmly agglutinated, forming a conglomerated mass of unrecognizable tissue.

It is interesting to observe that, in rare instances, adnexal involvement remains unilateral throughout the course of the infection. This is difficult to explain, unless for some unknown reason, as may occasionally happen, the uterine ostium of the uninvolved oviduct previously became occluded, thus preventing entrance of the infecting organisms. It is also noteworthy that, in rare instances, absence of one oviduct has been observed at operation. In the majority of cases adnexal involvement is bilateral.

The foregoing pathologic outline in a measure suggests the clinical manifestations which are to be expected. In acute cases the predominating symptom is pain which is usually continuous; it is aggravated by exercise in the upright position and is oftentimes relieved on assumption of the recumbent posture. Pain is also increased during defecation and at the

menstrual epoch. Dysmenorrhea is sometimes a concomitant symptom, and menorrhagia or metrorrhagia may exist. The character of the pain may be described as dull or sharp and severe. In bilateral involvement both lower abdominal quadrants are extremely tender and the slightest pressure increases discomfort. The temperature usually shows moderate elevation and the pulse is accelerated.

The symptoms enumerated are by no means pathognomonic of adnexal infection inasmuch as they are sometimes noted in other intra-abdominal inflammatory lesions, yet they are strongly indicative. When anamnestic and clinical investigations disclose a history of venereal disease, the presence of urethritis, vaginitis, endocervicitis, etc., or evidence of infection following abortion or childbirth, the diagnostic chain is practically complete. Thus, as in most other types of intra-abdominal pathology, the diagnosis must be made largely from the history and clinical findings.

Physical (bimanual) examination reveals marked tenderness in the oviducal and ovarian areas, and muscular rigidity is generally present in greater or lesser degree. Satisfactory palpation may be impossible because of tenderness and the increased pain thereby produced. The administration of a small amount of nitrous oxide gas and oxygen may occasionally be required to permit complete examination when otherwise the diagnosis is uncertain or obscure. In individuals with thin, relaxed or non-rigid abdominal walls, even in the acute stage, provided tenderness be not too great, the distended oviducts may be readily outlined. In the chronic stage, where rigidity and tenderness are not so pronounced, bimanual examination is attended by less difficulty, and the enlarged and tortuous oviducts can be more readily outlined by palpation.

The information afforded by laboratory investigation is of doubtful diagnostic value in either acute or chronic pelvic inflammation, inasmuch as the leukocytic range is high in all intra-abdominal infections. However, the leukocyte count does not range nearly so high in infection of the oviducts and ovaries as noted in acute appendicitis or ruptured viscera, unless there is leakage from a pelvic abscess or pyosalpinx producing pelvic peritonitis. Other blood findings, urinalysis, etc. are of no practical importance. Roentgen-ray or fluoroscope examination, with and without insufflation or injection of radio-opaque substances, has for the most part proved unavailing as a diagnostic procedure in pelvic inflammations.

It is noteworthy that after the infection has

progressed to the stage of chronicity, exacerbations and remissions are of frequent occurrence. Complete absence of clinical manifestations often engenders hope of spontaneous cure, but generally the quiescent periods are of short duration. When an acute attack is superimposed upon pre-existing chronic infection, the former symptoms recur with increased violence and there may be added thereto demonstrable clinical evidences of peritoneal involvement. Contrary to prevailing opinion, there is grave danger to life during the stage of chronicity, because of the possibility of intraperitoneal rupture of the distended oviducts with escape of purulent contents and development of fatal peritonitis. It is believed that the idea of "sterile pustules" is largely mythical; more-over, admitting the premise that the oviducal contents may eventually become sterile, the period when this may be expected to eventuate cannot possibly be predetermined.

As may be said of other human ailments, the most important aspect of pelvic inflammation is the treatment. It is a strange commentary that there yet exists no unanimity of opinion on this phase of the subject.

Formerly the generally approved plan was to employ conservative measures, especially when the patients were seen in the early stages of infection, and that custom is still followed by a great many physicians. The expectant plan includes: absolute rest in bed, the local application of hot compresses or an ice bag to the lower abdomen (the writer prefers the ice bag as it has been more effective in his hands) the hypodermatic administration of opiates to relieve pain, general supportive treatment, etc., with the hope that enhanced vital resistance might enable the patient to overcome the infection. Rarely spontaneous cure seems assured, but future invalidism is almost invariably the outcome.

For many years it was considered hazardous to surgically invade the pelvic cavity in the presence of acute infection, and operative intervention was accordingly deferred until chronicity had developed. Operation then disclosed the presence of organized adhesions, the natural result of a long-continued inflammatory process, with extensive agglutination of the pelvic viscera. Such were the conditions noted in the majority of operated cases previously treated conservatively.

With improvements in surgical technique and methods of asepsis, it was demonstrated that earlier operation was comparatively safe. It then became the vogue to excise the diseased oviducts only, leaving the infected ovaries and uterus undisturbed. Needless to say, since diseased organs were permitted to

remain in situ, permanent relief of symptoms seldom eventuated.

The next evolutionary step in treatment was the performance of salpingo-oophorectomy, but as the infected uterus and cervix were still allowed to remain undisturbed, enduring relief did not follow. Patients often returned within a short time complaining of pain, a purulent vaginal discharge, and other discomforts present prior to operation.

The foregoing sequence of events became so frequent in my experience that it seemed imperative, in the interest of the patient, to adopt more radical measures. Since having done so, my results have been much more satisfactory. Briefly the procedure now employed in the treatment of pelvic inflammatory disease is as follows:

The general pre-operative and post-operative care of the patient differs in no essential respect from that applicable to other cases in which abdominal operations are performed. In cases where the pelvic pathology seems to be extensive, and will probably necessitate hysterectomy, the vagina and the vaginal cervical segment are painted with 3½ per cent solution of the tincture of iodine, and the interior of the cervix is then cauterized with actual cautery, thus destroying any infection that may be present in the cervical canal.

The abdomen is prepared with 3½ per cent solution of the tincture of iodine, a midline incision is made of sufficient length to permit adequate exposure and examination of the entire cavity. In cases where there is extensive pathology of the ovaries, oviducts and uterus, the ovaries, oviducts, broad and round ligaments are clamped and divided; then the uterine arteries are clamped and divided, and the uterus removed, care being taken to dissect away any remaining cervical lining. Hemostasis is maintained by the use of hemostats until the uterus is removed. The cervical stump is drawn upward and painted with tincture of iodine. The round and broad ligaments and uterine arteries are ligated with No. 2 chromic catgut, and the cervical stump is closed with the same material. The round and broad ligaments are brought over and sutured to the cervical stump, thus preserving the pelvic floor. The cervical stump is then peritonealized, also any other raw surfaces resulting from the separation of adhesions, that may have been present. The abdominal incision is closed with or without drainage according to individual indications.

The method of procedure described was adopted some years ago, since which time the immediate and ultimate results in pelvic inflammatory disease have been infinitely more satisfactory than under older and more conservative plans of management. No longer

do patients return a few weeks or months after operation complaining of recurrence of symptoms; almost without exception they have been completely and permanently relieved.

In thus advocating radical treatment in the types of cases under consideration, I am not unmindful of the fact that were future child-bearing possible in young women having extensive pelvic inflammatory disease, deliberate destruction of that function would be a most serious proposition. However, when it is remembered that in the vast majority of instances these patients have already been rendered sterile because of anatomico-pathologic alterations due to virulent infective processes, and further that without radical treatment a future life of invalidism is practically certain, there should be no hesitancy in applying the procedure described, since it offers reasonable promise of immediate and permanent relief with restoration of health and usefulness.

CHRONIC APPENDICITIS*

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Historical and general considerations: For several decades the question whether chronic inflammation of the vermiform appendix ever occurs as a distinct clinical entity, has been constantly debated by some of the ablest diagnosticians and surgeons in the world. Many eminent authorities deny in toto the existence of chronic appendicitis, while others of equal prominence contend just as positively that the chronic form of the disease occurs with greater frequency than has hitherto been believed. Personally, I wish to express complete agreement with those who maintain the latter view. It is recognized, however, that the majority of appendicitis cases are observed prior to development of chronicity.

It is quite probable that the incidence of both acute and chronic inflammatory lesions of the appendix has not varied materially since the beginning of human existence. Scrutiny of ancient historic records discloses that abscesses in the right lower abdominal quadrant were successfully opened and drained in that remote period when practically nothing was known of pathological anatomy. It is recorded that the incision and evacuation of old encysted collections of pus in the right iliac fossa, resulting from inflammation of the appendix, was practiced as far remotely as the beginning of the Christian era; and that about 50 B. C., following the incision of a right-sided abdominal abscess, "much pus

gushed out." These limited citations are merely interpolated to show the antiquity of chronic appendiceal inflammations. Not until after 1700 A. D., however, was the fact clearly recognized that the disease originated in the appendix itself.

The proposition is quite generally accepted that in every type of chronic disease which afflicts humankind there has previously been an acute stage. While it is disputed by some competent clinicians, my firm conviction, based upon observation and experience, is that chronic appendicitis is invariably preceded by an acute attack. In a minimal number of instances however, this fact cannot be definitely established for one or more of the following reasons:

(1) That the primary attack may have occurred so early in life that the appendix was unsuspected as a causative factor.

(2) That the attack may have been so mild in character that its appendiceal origin was unrecognized or disregarded.

(3) That during an attack of violent right-sided abdominal pain no medical aid may have been sought, and after discomfort subsided the incident was forgotten by the patient.

(4) That pain in the right lower abdominal quadrant really due to an inflamed appendix may have been incorrectly attributed to some other cause, and the patient being misinformed as to its origin afterward gives no history of appendicitis.

(5) That in some instances the primary and even subsequent seizures may be so insignificant that both patient and attendant are misled and the belief is created that the appendix is not at fault.

Symptomatology and diagnosis: As might naturally be expected, the symptoms and clinical signs of chronic appendicitis are less pronounced in intensity and often vary widely from those observed in an acute attack. One of the most constant and significant signs is right-sided abdominal pain, which, instead of being violent as in acute cases, is described by the patient as an aching or "gnawing" sensation which produces varying degrees of discomfort at intervals, and especially while exercising in the erect posture. The importance of pain, however, must not be overestimated, since it is always present in inflammatory lesions of other intra-abdominal viscera.

The pain of chronic appendicitis bears no relationship to the ingestion of food, in contrast to gastric or duodenal ulcer. The individual exhibits more or less evidence of ill-health, the appetite is usually capricious, nutrition is impaired, certain articles of diet

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are not well tolerated, and there is complaint at times of vague gastric and intestinal disturbances, constipation, nausea, eructations, flatulence, abdominal distension, etc., but vomiting seldom supervenes except during an acute exacerbation.

The local findings are very significant and are of great assistance in diagnosis. Right-sided iliac pain, fixed tenderness—depending upon location of the appendix—usually over McBurney's point and moderate rigidity over the right rectus muscle, are the most important signs. During examination a definite difference in rigidity can be detected over the right and left recti muscles. To obtain this sign the muscles should be tested several times and care used not to exert enough pressure to overcome the muscle reflex, otherwise the comparison will be of no value. Epigastric pain with tenderness over the appendiceal area is not an uncommon symptom. It has been my personal observation that if a patient with chronic appendicitis be instructed to return for re-examination at periods when, comparatively speaking, his discomfort is the worst, the clinical signs mentioned can be elicited.

Pulse and temperature variations, and likewise the leucocyte count, are of less importance in chronic than in acute cases. While constant positive findings—slight fever, moderate pulse acceleration, slight leucocytosis, and especially a high polymorphonuclear percentage—are valuable as confirmatory evidence, they are not conclusive since similar phenomena are noted in other inflammatory lesions of the intra-abdominal organs. During an acute exacerbation in chronic cases, the symptoms are intensified and may approximate those of a primary attack.

In children and the young a history may be obtained of listlessness, capricious appetite, colicky pains that may at times be accompanied by nausea or vomiting, and a dread of playing rough games for fear of injury to the abdomen. With the local findings already enumerated, these will practically clinch the diagnosis of chronic appendicitis.

While the criteria established by the late John B. Murphy, concerning the sequence of events, or the order in which characteristic physical signs appear, are of considerable importance in acute cases, they are of little consequence when applied to the chronic type of the disease.

The pertinent fact must be remembered that in the female chronic appendicitis may simulate, be accompanied by or associated with, other right-sided inflammatory lesions notably oviducal, ovarian, more rarely renal, ureteral or cholecystic infections. Uterine displacements may produce symptoms quite

similar to those of appendicitis, and this is also true of visceroptosis especially in young and emaciated subjects. In suspected cases of visceroptosis, the patient should be placed in bed with the foot elevated, a liberal diet allowed, and a proper abdominal support or adhesive strapping applied. If visceroptosis is the cause of symptoms, relief should be obtained from these procedures.

Some of the difficulties attending the clinical diagnosis of chronic appendicitis are suggested by the foregoing brief survey of the symptomatology. At times surgical judgment is taxed to the utmost in arriving at a definite conclusion. Occasionally a positive pre-operative diagnosis is impossible, but sufficient evidence to justify exploration can generally be obtained by repeated physical examinations and diligent clinical inquiries.

The diagnostic feature of greatest importance is the history of a previous attack. As has already been intimated, chronic appendicitis does not arise *de novo*, it is always preceded by an acute seizure, which may have been either mild or severe. By according due consideration to the past history, with proper evaluation and interpretation of the symptoms made evident by painstaking examination and inquiry, a definite diagnosis of chronic appendicitis is possible in more than ninety per cent of cases. Personally, where the history of a previous frank attack is obtained, the patient having been at the time under the observation of a competent physician and the clinical diagnosis of acute appendicitis made, such fact is accorded greater diagnostic weight than any other feature and is often the determining factor in recommending operative intervention.

A careful roentgen-ray study by a competent man, where one is available, should always be made in doubtful cases. I am indebted to Dr. C. D. Enfield for the following remarks concerning roentgenologic examination of these cases.

Consideration of the x-ray findings in chronic appendicitis may probably best be approached by a recital of the behavior under x-ray examination of the normal appendix.

We expect the normal appendix to fill with barium at some time during the course of a gastro-intestinal examination provided it is observed closely enough. This filling may occur at four and one half hours after the barium meal has been administered, at six or eight hours, or between this and the twenty-four hour period when routine observation of the colon is usually made. The normal appendix is observed to fill fully and completely so that there are no gaps in the barium shadows as visualized on the fluoroscope or film. Its lumen should be reasonably con-

stant. There should be no marked clubbing at the end nor any marked constriction at any point. The appendix should be free as regards the cecum. The barium filled cecum should not mask the shadow of the filled appendix. It should be possible to move the appendix about under the fluoroscope without producing undue discomfort or any marked muscle guard. The head of the cecum should be movable through a range determined by the thickness of the abdominal wall which range will, therefore, vary somewhat according to the nutritional state of the patient and this mobility under palpation should not be accompanied by any particular tenderness or muscle guard. A normal appendix should empty completely of barium in a period of a few hours after it has been observed filled.

Of course, in individuals in whom there is no reason to suspect chronic appendicitis, we sometimes fail to observe a filled appendix during a routine gastro-intestinal examination. This is probably usually due to failure to make sufficiently frequent observations, and where the appendix is chiefly under consideration, more thorough examination and more frequent observation in the right lower quadrant after the four and one half hour period will reduce materially the number of appendices which fail to fill.

However, with older individuals it is possible that failure to fill, even under frequent observations, is not necessarily an indication of definite pathological change, except possibly in the sense that no individual past early middle life has an entirely normal appendix, just as MacCarty has said that no individual over thirty-five has a normal gall bladder.

With these normal criteria in mind, it becomes easier to outline the x-ray indications of chronic appendicitis. Failure to fill in an individual under forty, if observations have been made repeatedly at the proper intervals, is suspicious. Irregular filling the barium shadow being bisected or subdivided into several segments is considered abnormal. The presence of fecaliths interrupting the barium shadow is certainly abnormal though we have seen these in individuals with no other evidence of chronic appendicitis. A twisted, tortuous appendix fixed in position and not normally movable under palpation is most certainly diseased. Decided tenderness localized to the appendix and produced only on deep pressure, over the appendix shadow especially if coupled with a greater or less degree of muscle guard, is considered highly significant. The pressure of tenderness on pressure similarly renders any other abnormality observed in the x-ray behavior of the

appendix considerably more significant.

The appendix which fills normally but which fails to empty and retains barium for hours after the cecum has emptied must come decidedly under suspicion as such behavior with barium suggests the probability of similar behavior with regard to fecal residues.

Quite apart from the detection of evidence of pathological change, x-ray examination offers the only dependable evidence as to the location of the appendix. We are so accustomed to associating the appendix with McBurney's point that we sometimes forget that the organ may be found anywhere from the costal margin to the true pelvis on the right side and in not infrequent instances even on the left side. These anomalies of position are due to abnormal development of incomplete rotation or descent of the colon, except for the lower left side positions which may be due to complete transposition of the viscera. Even if the appendix is not visualized, demonstration of the location of the cecal head indicates its whereabouts.

In addition to the direct evidence obtained from observation of the appendix, more or less value is attached by various workers to certain indirect phenomena which are supposed to be frequent accompaniments of chronic appendicitis. The most clear cut and frequent of these are cecal stasis, a condition in which a considerable accumulation of barium remains in the cecum after the balance of the intestine has been cleared; and reflex spasm, especially frequent in the sigmoid and somewhat less frequent in the pylorus as a remote consequence of inflammatory disturbances somewhere along the gastro-intestinal tract. These spastic manifestations are not characteristic of chronic appendicitis but may and do also occur in chronic gall bladder disease and not infrequently in duodenal ulcer. The cecal stasis, on the other hand, when seen in chronic appendicitis is probably due to involvement of the head of the cecum in the inflammatory process which has involved the appendix to a sufficient extent to interfere with its rhythmic peristaltic efficiency.

It is not claimed that by x-ray examination alone one can make an entirely satisfactory and convincing diagnosis of chronic appendicitis. We do believe, however, that any or preferably several of the deviations from the normal, recited above, co-existing, in an individual with a suggestive history, in whom other abdominal lesions can be excluded with reasonable certainty, offer very strong support to such a diagnosis.

What complications are to be expected in chronic appendicitis? So far as the patient is concerned, there is the ever-present fear of

an acute attack with possible rupture and its attending sequelae. We are all aware that associated disease of the appendix is frequently encountered in operations for pathological lesions of the gall bladder, duodenum and stomach. This has been so often found in my personal experience that I cannot help believing chronic appendicitis is a contributing factor in the production of surgical lesions of these organs, especially of the gall bladder; and in recent literature numerous surgeons have concurred in this opinion. I am convinced that chronic infection of the appendix in childhood or early adult life, carried for a number of years in conjunction with the attending digestive impairment, is the cause of many of the so-called chronically sick adults that we all see in our practice. If the diseased appendices had been removed early, these individuals would have been spared much distress in later life; and the appeal of this paper is for a more careful study of the illnesses of children and young adults and to give more consideration than we have in the past to a diseased appendix as being the causative factor of their future disability.

Treatment: Of the treatment of chronic appendicitis little need be said. Medical management merely represents a delusion and a snare for the unwary. Chronic appendicitis is a surgical lesion and cannot be cured by the internal administration or external application of drugs. Operative intervention is demanded in every case where the diagnosis is even reasonably certain. The appendix may be excised by the method with which the surgeon is most familiar and from which he has secured the most satisfactory results.

In males I prefer the classical right rectus incision, which may be extended upward sufficiently to permit adequate exploration of the upper abdominal organs should this be necessary or advisable because of suspected cholecystic, duodenal or gastric lesions. In females especially when diagnostic uncertainty exists, it is perhaps better to make a liberal mid-line incision through which the entire abdomino-pelvic interior may be palpated, visualized, pathologic changes or complications detected, and the proper remedy applied. Especial care should be taken to free constricting bands about the terminal ileum or cecum that may be causing obstruction to the fecal onflow—and only those—peritonealising all raw areas to prevent formation of new adhesions.

In every instance in which I have made the diagnosis of chronic appendicitis, examination of the removed appendix revealed more or less characteristic pathologic changes, such as obliteration of the lumen, chronic inflammatory adhesions and constricting bands

which markedly reduced the blood supply and nutrition of the appendix atrophy, fibrosis, etc.

Thus far in my series of cases there has been no mortality, and in exceptionally few instances has there been failure to secure relief of symptoms. I am well aware that failures and re-operations have been recorded, the symptoms having continued or recurred, after appendectomy for supposed chronic appendicitis. In such cases the diagnosis was probably inaccurate or associated lesions were present demanding further operative procedure to afford permanent relief.

Even granting that the diagnosis of chronic appendicitis is correct and that appendectomy fails to relieve in a small percentage of cases, this should not be allowed to influence the surgeon against operative intervention, since that is the only method known by which the greatest good may accrue to the largest number of these unfortunate individuals.

The operative technique requires no further elaboration. The abdominal incision is closed without drainage unless some associated or complicating lesion demands the institution of drainage. The post-operative management differs in no essential respect from that applicable to other cases in which the abdomen is incised.

I have prepared in detail the histories and operative results of a few illustrative cases which time will not permit of my reading, but I hope they can be published in full in the *Kentucky Medical Journal*.

CASE REPORTS

Case 1. This case illustrates some of the difficulties in diagnosis. Complete recovery followed removal of the diseased appendix. L. C., female, white, aged 14, seen in October, 1923. The patient had the usual diseases of childhood, since which time she had been reasonably healthy. After repeated inquiry, however, the mother recalled that three or four years previously the child had at times complained of "stomach-ache" especially when exercising after a hearty meal, which was relieved by a purgative and dietary regulation.

Two months prior to date of observation the patient had a severe attack of abdominal pain accompanied by vomiting and was confined to bed for twenty-four hours. For the last month she had suffered almost constant pain in the abdomen, principally in the epigastrium, with occasional periods of discomfort in the right flank. She said she had less pain and was more comfortable when she took soft food and that she ate very sparingly. For the last three weeks she had been in bed under the care of a local physician. She had lost considerable weight, was easily irritated and

cried on slightest provocation.

As menstruation had not yet become established, the mother suggested to the physician that perhaps her symptoms were due to that fact, and if the menses could be induced her pain and discomfort might disappear. Unfortunately the physician concurred in this opinion and administered numerous drugs with hope of inducing the menstrual flow. However, he it said to his credit, that he made a rather thorough investigation, including the roentgen-ray examination of the chest, complete blood count and urinalysis, with negative findings, except that the urine contained albumin and hyaline casts. The patient was seen by me in consultation.

Physical examination: The child was much emaciated and very nervous. Heart and lungs negative; tonsils showed evidence of recent inflammation. Abdomen negative, except slight rigidity over right rectus muscle and persistent tenderness on deep palpation at McBurney's point.

In view of the history—extending over three or four years—of abdominal pain after ingestion of solid food and following moderate exercise, the muscular rigidity and tenderness at McBurney's point, we made the diagnosis of chronic appendicitis. Accordingly the patient was brought to the Jewish Hospital and operated upon after a week of preparatory treatment.

Celiotomy: right rectus incision. Small amount of straw colored fluid in pelvic cavity. Careful search for evidence of tuberculous peritonitis was futile. Although the appendix was elongated and the tip adherent, there was little indication of inflammatory change. Several bands of adhesions around the cecum and terminal ileum were separated and the appendix removed, the base being inverted by pursestring suture of linen. The appendix contained a fecalith and there was a constriction in about the middle portion.

The patient made an uneventful recovery. The third day postoperative she told me very positively that I had "removed the sore place in her stomach." She remained in the hospital ten days. Urinalysis just prior to her dismissal showed no casts and only a slight trace of albumin.

Within two months the appearance of this girl had so changed for the better, that one could hardly realize she was the same child. She is now a perfectly healthy and normal young woman.

Case II. In the second case, diagnostic difficulties were also encountered. There were wide spreading complications, the appendix being the site of focal infection.

A. S., Jr., male, white, aged 23, was seen

by me in August, 1924. The patient had the usual diseases of childhood and the history showed that he had always been more or less delicate. When 13 years old, he had what was considered typhoid fever, but remained in bed less than three weeks. Careful questioning at first failed to elicit any history of previous abdominal pain. However, at subsequent examination, he recalled that four years previously, while attending boarding school, he had an attack of pain in his abdomen, lasting two days, which the physician, who saw him believed was acute appendicitis.

For the last four months the patient had been below par physically, not sufficiently ill to consult his physician, but he did not feel well and had slight fever at times. He complained of digestive disturbances, but had no nausea nor vomiting. He denied having recently had any pain in his abdomen. However, he had considerable gaseous distension and slight discomfort in the gall bladder region.

Two weeks afterward he began feeling worse and consulted me for what he thought was an ordinary cold. He was referred to Dr. Sam P. Myer, who diagnosed "slight cold with bronchial irritation" and prescribed appropriate medication. We heard nothing more from him for seven or eight days. He then called Dr. Myer and I saw him in consultation. He had been in bed the two preceding days; temperature 99° to 101° F.

Physical examination: The general appearance of the patient indicated that he was seriously ill. He had considerable dyspnea and complained of distress particularly over the cardiac area. An alvine evacuation had occurred that morning, and nothing abnormal was noted in the abdominal examination except slight rigidity over the right rectus muscle and some tenderness in the gall bladder region. Liver dulness was increased, the right lobe being palpable below the costal margin. In examining the chest, we were particularly impressed by the muffled heart sounds and the increased area of cardiac dulness.

The patient was sent to the Jewish Hospital for further observation and study. Roentgen-ray examination of the chest by Dr. B. W. Bayless, showed an enormously distended pericardial sac. Dr. Virgil E. Simpson, who saw the patient in consultation, concurred in our findings, and advised that paracentesis pericardii be performed. This was attempted but proved unsuccessful; although the pericardial sac was entered, no fluid was obtained. Based upon the positive roentgenoscopic evidence that fluid was present, it was decided to expose and incise the pericardium. Under

novocaine anesthesia the fifth rib with its cartilage, was dissected for about two inches. When the pericardium was exposed and opened it was found to be densely adherent to the anterior surface of the heart. A small catheter was then introduced behind the heart and fourteen ounces of blood-stained serum removed. Examination of the fluid by culture proved it to be sterile. This led us to believe that the pericardial infection was not primary but secondary to a focus elsewhere.

The patient underwent a storm period during the first twenty-four hours. The wound healed rapidly without infection. Ten days later roentgen-ray examination of the chest showed reaccumulation of the fluid with even greater distension of the pericardium than before paracentesis. The status of the patient continued practically unchanged. There was slight general improvement, but about every ten days the temperature rose to between 99 and 101 degrees F. The administration of salicylates caused subsidence of fever within two or three days.

Every possible effort was made to locate the focus of infection, but by using all the known means at our command we were unsuccessful. The patient was allowed to go home where he remained four weeks during which time there was marked improvement in his condition. Another roentgen-ray examination was then made by Dr. Bayless which showed the pericardium normal in size. During the succeeding week, however, the patient did not feel quite so well; temperature 99 to 101 degrees F. By repeated subsequent examinations I was able to elicit slight rigidity and definite tenderness at McBurney's point. There had been considerable gaseous distension of the intestine during the entire period of his illness.

Finally the patient recalled that he had an attack of what was thought to be acute appendicitis four years previously. In the meantime, I had become convinced that he had chronic appendicitis and was hopeful that appendectomy would relieve him. It was explained to the patient and his family that, although diligent search had been made, no other source of infection could be discovered; that we were almost certain he had a diseased appendix, and believed we were justified in asking their consent to its removal. To this they agreed and the patient was removed to the Jewish Hospital.

Celiotomy: right rectus incision under ether anesthesia. The appendix was distended with gas and contained several fecaliths. The serosa was infected and showed evidence of subacute inflammation. The appendix was removed and its base inverted by pursestring

suture of linen. A band of adhesions extended from cecum to ileum and caused partial occlusion of the latter. This was divided in one direction and sutured in the opposite. There was a typical Jackson's veil extending over the cecum and adherent to the abdominal wall; this was divided. There was one firm, rigid band—almost a ligament—the proximal end of which was attached anteriorly to the abdominal wall near the gall bladder, and the distal end attached to the base of the appendix, which had caused marked rotation and angulation of the cecum and ascending colon. This band was divided allowing the cecum and colon to assume their normal relations. It would seem probable that this band, by its attachment near the gall bladder, was responsible for the pain of which the patient complained in the gall bladder region.

The patient had a normal convalescence. Within two months he had gained over thirty pounds of weight and has remained well. About a year ago he developed an inguinal hernia, for which he was successfully operated upon, and a thorough examination at that time revealed that he was perfectly normal in every way.

Case III. This case illustrates the reflex action in stomach exhibited by chronic pylorospasm with no evidence of gastric pathology. Patient relieved by appendectomy.

L. R., male, white, aged 28, automobile mechanic, was seen by me in October, 1925. According to the history, when ten or eleven years old, he had a severe attack of abdominal pain—which was diagnosed as "inflammation of the bowels"—and was confined to bed three days. Four weeks elapsed before he fully recovered from this attack. He then remained fairly well until four years previously, when he began having "indigestion" and nausea, which was relieved by vomiting. These discomforts gradually increased in severity, and during the last month, he had been forced to induce vomiting before relief could be obtained. After the stomach was completely emptied, there ensued a period of two or three days of comparative comfort.

The patient in the meantime had consulted several physicians and the diagnosis of "chronic dilatation of the stomach" had been made. Of the numerous methods of treatment tried, he received the greatest relief from strict observation of the so-called "Sippy diet;" but whenever he departed from this his nausea and vomiting recurred.

Roentgen-ray study of his gastro-intestinal tract revealed nothing abnormal except an enormously dilated stomach; there were no duodenal defects. A tentative diagnosis of pylorospasm was made. Careful examination of his abdomen was negative; no areas of

tenderness could be elicited. Based on the diagnosis of pylorospasm dietary and other appropriate treatment was instituted, and the patient requested to return for further observation in two months.

When he reappeared he reported that there had been practically no improvement in his condition, and insisted that something be done for him. An exploratory operation was suggested, to which he readily agreed.

Celiotomy: right rectus incision. A greatly enlarged stomach immediately presented in the incision. Careful examination of the entire stomach, gall bladder and duodenal regions revealed no pathology. The appendix was elongated, and while it showed no evidence of recent inflammation it was firmly fixed by numerous band of adhesions to the cecum and ileum. There was a typical Lane's kink, which markedly displaced the terminal ileum and caused partial obstruction. The appendix was removed and all constricting bands, including the Lane's kink divided and peritonealized so far as possible. No other pathology was found in the abdomen.

The patient made a satisfactory recovery, and after dismissal was again requested to return in two months. Upon his return he was greatly improved and said he was entirely free from discomfort. After a barium meal the emptying time of the stomach was found normal, and it was also normal in size.

The last report from the patient, received three months ago, indicates that he has remained perfectly well.

Case IV. This case illustrates the value of careful and repeated examinations for proper diagnosis.

H. G., female, white, aged 32, married, was seen by me November 14th, 1927. The patient stated that she had not felt well for nearly five years. She had been married a year and a half, and had a miscarriage within six months. She said she had suffered from dysmenorrhea ever since menstruation became established, and thought she bled more than normal during her periods. She did not recall having had any severe pain in her abdomen. During the period of four or five years mentioned she had complained of "indigestion," constipation, intestinal flatulence, and frequent headaches.

For the last two years her diet had been limited and in consequence she had lost considerable weight. She rarely attempted to eat any breakfast, because when she did so, she invariably became nauseated and vomited. The vomiting usually relieved her distressing nausea, and she frequently drank large quantities of water in order to empty her stomach and thus obtain relief. Careful inquiry re-

vealed that she had been aware of soreness and tenderness in the right abdominal quadrant.

Physical examination: Tongue serrated, coated, breath very offensive. Tonsils and glandular system appeared normal. There was some enlargement of the left lobe of the thyroid, and she also had tachycardia, but the heart sounds were normal. No abdominal masses were detected, but there was rigidity and tenderness over the appendiceal area. The uterus was normal in size and position; there was some tenderness in the left tubal region.

The patient was informed that she probably had chronic appendicitis, and that an operation would be necessary to relieve her symptoms. She was placed on routine treatment, with respect to diet, regulation of intestinal function, etc., and kept under observation for three months. She was requested to report for examination at times when her "indigestion" and nausea were the most distressing. Investigation of the abdomen at those periods invariably revealed tenderness over the cecal area and the cecum distended with gas. While there had been some improvement in the patient's condition at the end of three months, she was advised to have her appendix removed and consented to the operation. She was accordingly removed to the Jewish Hospital.

Celiotomy: mid-rectus incision under gas and ether anesthesia. The appendix was free, but contained a hard fecalith; there was a distinct constriction in about the middle, and it was greatly distended with gas. The distal segment of the appendix showed marked evidence of inflammatory change. A band attached to the ileum and cecum caused some obstruction of the ileal lumen. This band was divided and the appendix removed, the base being inverted with pursestring suture of linen. The left ovary contained a small follicular cyst which was punctured. The gall bladder was normal and contained no calculi.

The patient made a satisfactory recovery, but was kept in hospital three weeks for rest and forced feeding. She was greatly improved when dismissed and had gained in weight. Since then she has gained fifteen pounds, is free from digestive disturbances, her former rather morbid outlook on life has disappeared, and she says she is perfectly well. She is able to eat three meals a day without nausea or discomfort.

DISCUSSION

Irvin Abell, Louisville: Dr. Henderson has given us a practical paper upon a condition which is perennial. The causative infections in dis-

eased tubes coming to operation have been shown by statistics to be approximately as follows: fifty per cent follow postpartal and postabortal infections, forty per cent follow gonorrheal invasions, eight per cent are of tuberculous type, and two per cent will be covered by the blood stream infections occurring in the exanthemata and by the infections from the appendix and other abdominal lesions.

The essayist has limited his remarks to the two which proceed from the outside, the gonorrheal and the pyogenic. In the brief time at my disposal I wish to elaborate upon some of the points which he has made, with particular reference as to the indication for surgical procedures.

As stated, gonorrheal invasion, unless complicated by pyogenic infection, is practically always a mucosal disease, beginning in the urethra, in the Skene's glands, the vulvovaginal glands, localizing in the utricular glands, in the cervical glands, and finally the epithelium or mucosal lining of the tubes itself. In so long as it remains free from pyogenic contamination, this disease remains practically a mucosal disease. Since this is true, practically all cases regardless of how acute the tubal manifestations are, should be treated expectantly until time will demonstrate whether or not such tubes will undergo resolution or whether they will show the chronic changes as indicated by the essayist. That they do undergo complete resolution is a matter of observation with most of us. Some patients show complete regeneration of the tubal mucosa and subsequently go through normal pregnancies.

Since the disease occurs at the time of greatest sexual activity, since the majority of the patients presenting gonorrheal pelvic inflammations are youthful, since their lives of fertility and motherhood are, if possible, ahead of them, personally I feel that all cases of gonorrheal infection in the tubes should be treated expectantly until time has demonstrated that they have become chronic and consequently have destroyed fertility and continue to give symptoms. When I say continue to give symptoms, it is recognized that such patients, while they may not make a complete anatomic regeneration, do at least reach a stage of symptomatic cure in which they are practically free of symptoms. Under such circumstances, the treatment again of course should be continued as expectant.

In the event that they do not have this happy conclusion, that they do present diseased tubes, pyosalpinx as mentioned by the essayist, what is to be the procedure of choice? It is true that the points of localization of infection are in the tube, particularly in the uterine end and in the cervix. Are we to make a complete excision of the uterus or are we to give the patient the benefit of a more conservative operation? It is

true again that in gonorrheal invasion in which there has been no pyogenic contamination, the ovary ordinarily is not destroyed. It might be considered as an organ in bad company with a perioophontitis rather than the invasion of the ovarian tissues itself. In so far as my personal preference is concerned, since these are young women, I prefer the excision of the tubes, the cornua of the uterus, so as to get all the tubal mucosa, and either a corneal excision of the cervix or what in the vast majority of instances is easier to carry out and almost as satisfactory, a puncture cauterization of the cervix with destruction of the cervical glands. Treated in this way, these young women are still left ovulation and menstruation and they have mental tranquility which oftentimes would otherwise be lost. They are also left the hope of fertility which, however visionary, is a matter of support to them.

infection, we may differ a bit as to the handling surgical procedure at this time.

C. W. Hibbitt, Louisville: While we practically agree as to the mode and the progress of of the case as outlined by the essayist.

In the Gynecological ward at the City Hospital in Louisville, where we come in contact with hundreds of cases of this infection yearly, we adopt as simple a method as possible to gain results.

The larger number of this class of cases that come there are gonorrheal in origin, and young women. The internes are instructed, or it is a general rule in this department, to put a patient with this infection or with the pelvic involvement in bed and keep them at rest, our experience has shown us, regardless of what you do to the abdomen, either hot or cold compresses, or any other routine, the thing that gives results is absolute rest. You can take patients of the same class and put them side by side, you can give one hot compresses or cold compresses, as she may desire, and they will usually express what relieves them quickest; you may give her aspirin, morphin, or other drugs, and a patient of the same infection in bed by her side and doing absolutely nothing for her except rest, and they will usually progress along the same line. The acute condition becoming quietest in one as quickly as in the other.

After absolute rest in bed until the acute involvement in the abdomen is over, then if the patient is young in years we endeavor to persuade her to go out and have local treatment and proper advice and care not adopting any surgical procedure at this time.

If these patients return, and the larger number of this class will return, and the involvement is such in either tubo-ovarian region that it looks as if no local or general treatment will have any effect, then we advise surgical interference. If

they come in a second or third time in the acute stage, the tendency formerly was to operate at once. We never operate on an acute case if it can possibly be avoided. Indications are to wait until the temperature of that acute pelvic abdomen has established itself. When this temperature has probably been 102 and finally runs down to 99 or 100, and remains that way for a week, I think that patient is ready for surgical interference if we have decided that it is really an operative case.

One word as to the care, if we intend to operate on the case, this I think, regardless of whether the tubes are removed, or whether the hysterectomy is to be preferred or to be done in this particular case, we should, conserve as much ovarian tissue as possible, and to insure success in this conservation we must remember two things to do to carry this out: An ovary must be first brought up out of its old bed of adhesions and it must be kept out of its old bed of adhesions. Second, and most important, I think, is to leave a normal blood supply to the ovary, for without that we might as well have no ovary whatever. And our ultimate successful result becomes a failure.

Hayes Davis, Louisville: I was asked to discuss the paper of Dr. Grigsby. As the time is so limited I shall not attempt to discuss that of Dr. Henderson, which is purely a surgical condition.

The question of chronic appendicitis is a very interesting one, owing to its frequency. We all come in contact with the type of individual who suffers from various obscure abdominal symptoms. These cases are often quite puzzling; the symptoms are not typical, and it requires a very careful study before any definite conclusion can be reached. However, with proper care and observation of these cases, and especially with the history of previous attacks of appendicitis, one can usually arrive at a satisfactory conclusion, especially if the use of the x-ray is employed.

With the symptoms that have been outlined by Dr. Grigsby so thoroughly and which need not be further discussed, and the use of the x-ray, especially with careful fluoroscopic observation, and palpation, together with study of the films, and the conditions that have been fully covered, one can usually arrive at a conclusion that chronic appendicitis exists, although we must take into consideration that many of these cases are complicated by adhesions in the region of the cecum, in the region of the pelvis, by chronic salpingitis, by chronic gall bladder conditions, and various other abnormalities that exist in the abdomen. This is especially difficult, of course, in women, where chronic salpingitis is so frequent.

It is most important in these cases to make a

proper diagnosis, as many of these cases remain invalids and suffer with more or less obscure digestive symptoms during the rest of their lives when oftentimes a simple appendectomy will give relief.

It is especially important to remove the appendix in chronic cases, as Dr. Grigsby has mentioned, as complications may come about in the course of time, which lead to extensive abdominal adhesions and gall bladder conditions. When extensive abdominal adhesions occur, the removal of the appendix often does not accomplish very satisfactory results. It has been my experience with cases that are neurasthenic and who have a considerable degree of adhesion of the peritoneum, that operations are not very satisfactory. After the operation, adhesions often return, and the patients continue with their nervous and digestive symptoms, often seeking further operations with further production of adhesions, and finally passing into a state of chronic invalidism, which is absolutely impossible to eradicate. Therefore, if we can discover these cases early, before the damage is done, and remove the offending organ, we save these individuals much future suffering throughout their existence.

This operation as the treatment of chronic appendicitis is especially indicated owing to the fact that the results in the majority of cases are so satisfactory and the mortality so low. When we have chronic gall bladder conditions, and as Dr. Grigsby has said, the vast majority of people after thirty-five years of age practically all have some abnormalities of gall bladder, we cannot always expect the same results that can be expected in appendicitis, as we all have experiences of mortalities in gall bladder disease when they are the least expected and have return of the symptoms of gall bladder disease even after the removal of the gall bladder. But with chronic appendicitis without complications, the results are usually most satisfactory and the operation is practically entirely without mortality. For this reason, if we can make the diagnosis sufficiently early and have the appendix removed, these cases are relieved of much distress in their future life.

George A. Hendon, Louisville: There is one procedure that I should like to bring before your attention that concerns this tubo-appendicular problem. We often have operative cases where large abscesses have occurred that make the recovery of the patient a matter of extreme doubt. To illustrate what I mean I can mention a case in which the pelvic abscess had so far involved the loop of the ileum that resection of the intestine was absolutely required, and an anastomosis had to be made. That is merely an illustration of one form of the extensive involvement that you will come in contact with. The

appendix, if it has been preserved and has not fallen prey to the zeal of preceding surgeons, forms a most valuable aid. Our procedure is first to cut the meso-appendix, then bring the appendix out through the lower angle of the incision, and pass a catheter through the appendix into the bowel, and put a stitch through the catheter in the appendix in order to retain it in position and the other end of the catheter hangs down to the side of the patient. In this way you permit the escape of gases, you can administer enemas, fluids food and medication and drain the colon and relieve the great distention that follows cases that have extensive suppuration. In other words, you can make the appendix perform the function of a provisional rectum over a limited period of time. The appendix sloughs off in five or six days.

I have done sixteen cases that way and have never had a fecal fistula resulting, and all the patients got well, except one.

J. Duffy Hancock, Louisville: Dr. Grigsby did not place very much emphasis upon the gastric disturbances that frequently accompany a chronic appendix. We are all familiar with the fact that a diseased gall bladder or a diseased appendix is quite likely to cause gastric disturbances, just as likely in many cases as is a gastric or duodenal ulcer. The distinction between the different kinds of disturbances I think is due to the difference in physiology of the organs concerned. In gall bladder disease the gastric disturbances are generally those of a chemical nature, due to the disease of the gall bladder, and they are generally nausea, maybe belching, and discomfort coming on at about the close of a heavy meal. The symptoms of gastric disturbance due to an ulcer are generally pain which is rather boring and constant in character, which comes on at a rather definite interval after the ingestion of food.

The symptoms from a diseased appendix are generally either pain or vomiting, without much nausea, and this I believe is due to the fact that the cause here is a motor one, due to the fact of the continuation of the muscle and its nerve supply from the stomach down to the ileocecal region. As I say, the symptoms then are those that we would expect to be of a motor nature rather than a chemical nature. They consist of vomiting, which may come on almost immediately after the ingestion of food, or of pain, which comes on at a variable rather than a regular time after the ingestion of food, which pain is more of an irregular and cramping nature than is the pain due to ulcer.

Louis Frank, Louisville: I heard Dr. Hendon say on one occasion that appendicitis was like the weather, anyone could talk about it. Probably that is my excuse for discussing this paper. However, I have very little to say about

the appendix. I want to say that my experience has been entirely different from that the last speaker has related. The cases of gastric disturbance I have seen usually fall in that class that are grouped as due to hyperacidity.

With reference to appendicitis, Dr. Wallace Frank has expressed my opinions very, very well, I really see fewer and fewer numbers of chronic appendicitis every year that I practice medicine, and those that I do see have had the appendix removed elsewhere and are returning because they still have their chronic appendix pain after the removal.

I think we have in the x-ray a very valuable aid to diagnosis, as pointed out by the essayist, but I should like to call attention to the fact that we may have a retrocecal appendix or we may have an undescended appendix which is held down, not moveable, and yet which may not be the seat of pathology or of disease.

With reference to the first paper, and that is the one that I particularly got up to discuss, I want to agree in the main with almost everything that has been said by Dr. Abell and Dr. Hibbitt as to the conservative treatment in acute cases of gonorrheal salpingitis or gonorrheal infections. I think we make a tremendous mistake to operate upon these patients in the acute stage. This was pointed out so well by Simpson of Pittsburg years ago, I do not mean from the standpoint of what should be done finally, though none of them should be operated on while acute. If we take a series or group of these cases and operate on them during the time that they are running temperature and during the time their acute infection is going on, our mortality rate will be exceedingly high. Simpson, as I say, demonstrated in a series of 100 cases, that following the plan advocated by Dr. Hibbitt, of waiting until temperature subsides, until there is no recurrence of temperature after a thorough vaginal examination, or bimanual examination, and if the patients do not suffer pain from such examination, then they can be operated upon with a mortality that is practically nil.

I also do not agree with the essayist that we have unilateral infection of the tubes with gonorrhea. I think when one tube is infected the other is infected. If you take one out, take them both out. If you don't take both out at one sitting you or somebody else will take the other one out at a subsequent sitting.

I think we have in intra-abdominal air insufflation, if we want to carry it out, a means of diagnosis in chronic pelvic disease with fixation of the uterus or of the pelvic organs which is very valuable. It is absolutely positive, just as much as inflation of the tubes with air which he spoke of.

I want to say one other word about infected tubes. We do not see nearly so many cases

since we are no longer on the gynecological side of the City Hospital, nor do we see so many cases of infected tubes and pelvic inflammatory disease in private practice as we saw formerly. Notwithstanding the promiscuity of the indulgences of which the essayist speaks, we are not seeing in private practice among that class of individuals nearly so many cases of gonorrheal infections and tubal infections as formerly. In none that I have ever seen operated on, have I been able to have cultivated out of the tubes, organisms unless there was a mixed infection at the time. We have never been able to cultivate the gonococcus out of gonococcal tubes. Nor have we ever found them in the tubes on section.

Frank T. Fort, Louisville: Relative to pelvic inflammation I believe in conservative treatment. Relative to appendicitis, I believe in radical treatment. I can recall three cases, one eight years after the birth of the last child, inflammation developing, where I had a terrible mass in the pelvis. I took it all out a year after the baby was born. In three other cases children have come to gladden the home after an operation for pelvic cellulitis or inflammation. In appendicitis, I believe these cases of digestive disturbance, call it hypersecretion, or what not, if you will investigate thoroughly you will find you have an appendicitis. Whether that appendicitis comes from focal infection or otherwise, you are going to find a kinking. Every time you open up the abdomen you most likely find a kink in the appendix, or the extremity enlarged or the proximal end contracted, showing that there has been some trouble there.

Three years ago I had I think, a very atypical case myself. I had reached fifty years without ever having a symptom of appendicitis, and it came on suddenly at a time when it had no business coming on. I was over the roulette table in a place in Northern Michigan, and I was struck with a pain and went home, quit eating, put ice bags on me, and still the thing ruptured.

I knew when I had the appendicitis. I knew when it ruptured, and walked in the hospital from my car and was operated on. That has been, to my mind, one of the most peculiar cases of appendicitis I have ever known.

Appendicitis is not always easy to make out, and I think you had better err ten times in taking out practically normal appendices than err one time and allow the patient to die. I am sorry my appendix wasn't taken out forty years earlier.

D. M. Cox, Louisville: About fifteen per cent of pelvic inflammatory diseases will clear up under conservative treatment without operation. But operation having been decided upon, the question is what should be done. Wouldn't it be a good thing to give these patients prepara-

tory treatment in a more or less routine way, as Dr. Hibbitt has outlined, as it done with goiters?

In the cases at the City Hospital last year, which were treated according to the method just outlined, there were 197 cases operated on, with two deaths, one death due to a complication of pulmonary abscess which ruptured and the patient died immediately after the rupture.

E. L. Henderson, Louisville, (in closing): I wish to thank the gentlemen who discussed my paper. I think some of them, though, rather misunderstood my position in operating these cases. We all see lots of cases of pelvic congestion, as it were, that do not reach the stage of pyosalpinx or tumefaction of the tubes and ovaries, that never should have surgical intervention. We see a lot of these cases that are never even sent to the hospital that in a few days or a couple of weeks will clear up without any surgery at all, but the cases I had in mind, especially were the cases that really go to pus formation and where you have real tumefaction of the tubes and ovaries.

If you use this treatment, you will get far better results than if you take out the tubes and leave an infected uterus or an infected ovary. It has always been my policy to conserve the pelvic tissues as much as possible where it is practicable. But I have in the past seen so many cases that have returned for future surgery where an infected uterus was left or where infected ovaries were left, that I have gotten to the point where I am much more radical in this respect.

I was especially interested in Dr. Grigsby's most interesting paper. I think that one of the chief points in chronic appendicitis is a diagnosis. We so often see cases returning that have been operated on for chronic appendicitis that have some other trouble, some renal condition, possibly a renal stone, or chronic gall bladder infection. I think it is very frequent also that chronic appendicitis and chronic gall bladder infections are closely associated.

The doctor spoke of pain being the most important symptom. That is true to a certain extent, but I believe that digestive disturbance is one of the most important symptoms in chronic appendicitis.

Another reason that we very frequently do not get good results or permanent results following operation for chronic appendicitis is that these cases run on for so long that they develop a lot of adhesions, and even after the appendix is removed they still continue to have gastrointestinal symptoms, they continue to have pain, and the chain of symptoms is very similar to that, that they had before operation.

Guy P. Grigsby, Louisville, (in closing): I wish to thank those who discussed my paper. I

had hoped that by discussing anything as common as appendicitis I would get a lot of discussions and a lot of arguments, but I guess we have had so much argument on fractures that everybody is sort of worn out with arguments.

What I had hoped to do by my paper was merely to stimulate your thoughts along the line of an old subject, with the idea that it would make you a little bit more careful in the study of those cases of illness in children and young adults, with the idea that perhaps it may be a chronic appendicitis, and to make you a little bit more diligent in your search in that regard.

I am firmly convinced, as expressed in the paper, that if many of these cases were recognized early in young adult life and in early childhood and their appendices were removed, much future illness would be prevented.

As I say, I am firmly convinced of that, and I feel that in my personal experience in those cases in which I have made a proper diagnosis of chronic appendicitis, they have been relieved, providing I got them early enough before other existing complications occurred that made it impossible to remove all the pathology present.

EYE OBSERVATIONS IN FRACTURES OF THE SKULL AND SEVERE HEAD INJURIES

MILUS L. GUNN, M. D., F. A. C. S.
Harlan.

For the proper interpretation of injuries at the base of the brain recognition of the eye manifestations are often of the greatest importance and only through co-operation of the surgeon and oculist is it possible in certain cases to preserve the sight and facilitate recovery of the patient. The eye symptoms, as a rule, are not the result of fracture displacement or trauma directly, save in gunshot injuries, stab wounds, and depressed fractures or penetrations, which lacerate and tear the brain substances, but arise through brain compression from hemorrhage, brain edema, and inflammatory exudate. This latter is termed indirect injury. Why indirect injuries are so badly tolerated is readily comprehended when one reflects that the cranial cavity is completely occupied by the brain and its membranes, and that the bony cranial walls are rigid and unyielding so that volume increase can occur only where there has been brain compression. The optic nerve in reality is an extension of brain tissue, enclosed sheath—like by the brain membranes—and in such a way that the vaginal space which surrounds the nerve as far as the eyeball is in direct communication with the intra-cranial lymph spaces. The construction of the eye-

ball may roughly be likened unto that of the cranial cavity, in that it too is enclosed by the unyielding sclera, a firm and unyielding connective tissue membrane with but a single opening and this constructed sieve—like, through which the optic nerve fibers and its vessels make their entrance and exit. An increase in tension of the cerebrospinal fluid must exert a corresponding rise in pressure upon the optic nerve and this is followed by interference in the circulation from the eye with strangulation at the unyielding porus opticus, as a result of which edema of the optic nerve papilla arises. Papilledema, or a blurring of the disc, then is an early and valuable diagnostic symptom in many basal injuries and the general surgeon should have a competent oculist make repeated ophthalmoscopic examination of the eye fundus in such patients, since if the papilledema is permitted to continue unrelieved optic nerve atrophy follows and the patient, although he makes a recovery, does so with the loss of his eyesight. According to Uthoff rapidly developing neuritis or choked disc after fracture of the base of the skull is of serious prognostic omen. Kearney reports constant findings of blurring of the disc edges with some edema, Wilensky agrees with this, while many other observers fail to corroborate.

According to Dowman, there are seldom any noticeable changes seen within six hours following injury. After this time a definite dilatation of the retinal veins may be noted where the intra-cranial pressure is increased. This finding may be accompanied by a hyperemia of the discs and at times a beginning edema of the nasal halves of the discs. After twenty-four hours, there may occur a very definite choking of the discs provided the intra-cranial pressure is markedly increased and if present, this sign may indicate the type of treatment which should be given. Sharpe states that the presence or not of choked discs as the signs of increased intra-cranial pressure has possibly retarded the recognition of the earlier signs more than any other factor. In the acute stages the fundi rarely give any information other than what one can glean from other sources.

In my experience a typical "choked disc" is never seen in fractures of the skull. However, fullness of the vessels and a slight degree of blurring at the margin of the disc is always present with increased intra-cranial pressure.

Pupillary Changes: The sympathetic fibres which enter the cranial cavity with the internal carotid artery convey the fibres which have to do with dilatation of the pupils. According to Dowman, the area of entrance of these fibres into the cranial cavity

*Read before the Kentucky State Medical Association, Richmond, September 10, 11, 12, 18, 1928.

is that which is not infrequently the site of fracture. Injury to these fibres therefore may stimulate or paralyze, thereby* causing either dilatation or constriction of the pupils on the side of the injury. The third cranial nerve which has to do with pupillary contraction is rarely injured in its peripheral course. The third nucleus or its cerebral connections are subject to injury by contusion just as any other area of the brain. It is thus seen that any type of pupillary changes may be met with in injuries to the head. In a series of 223 cases reported by Carter, there were 48 cases with pupil dilated on the side of the lesions; mortality, 95 per cent. Cases with no pupil-dilated on the opposite side of the lesion, 20; mortality, 95 per cent. Cases with no pupillary change, 155; mortality, 23 per cent. He states that the pupillary changes are rather good indications of the amount of intra-cranial damage. In fixed dilated pupils the mortality is extremely high. This seems universally true, thus, Cohen calls attention to the poor prognosis associated with fixed dilated pupils, Nichols advises against operation when they are present, Crandon and Wilson show 131 deaths in 142 cases. The dilated pupil is most often on the side of the injury, for there the damage is severe, so much so as to cause 52 per cent mortality in Carters series.

Sharpe explains the pin-point pupil as due to cortical irritation from supra-cortical hemorrhage, producing the irritative stage of pupillary contraction. When the compression of the cerebral cortex increases, it gives way to the paralytic stage of dilated pupils. When a pupil which was equal to its mate on admission, later becomes dilated, it means that the intra-cranial damage is increasing, and one becomes suspicious of an extra or intra-dural hemorrhage, although some authors emphasizes the point that an extra-dural hemorrhage is often accompanied by irritative phenomena rather than paralysis.

The following case is somewhat typical of the ones seen in my own experience:

A young man, age 30, seen recently in consultation with Drs. W. P. Cawood and R. G. Spurling, was injured in an automobile accident. The automobile turned over, pinning his head to the ground. He was admitted to the Harlan Hospital unconscious, bleeding profusely from both ears and nose. There was slight swelling just behind and over the left ear, but the skin was not broken. X-ray examination showed no fractures. He remained in a semi-conscious state for several days and became very irrational. I saw him two weeks after the injury. The right pupil was widely dilated and fixed. The left was small and reacted to light stimuli. There was

slight paresis of the right external rectus muscle. Examination of the fundi showed a slight engorgement of the veins in the right eye while the left was perfectly normal in every respect. Repeated lumbar punctures showed no increased pressure, and examination of the fluid by a competent laboratory man showed no abnormality. Examination of the ears showed a rupture of both drum membranes. It is very likely that a large quantity of cerebro-spinal fluid escaped through the ruptured ear drums which accounts for the fact that this man had no increased intra-cranial pressure. Dr. Spurling advised against surgical interference. A rather grave prognosis was made in this case, but he has continued to improve daily and at the present time recovery seems a certainty.

I also wish to report another case which I saw several months ago:

S. B., male, aged 42, came to my office on November 17, 1927, with the complaint of total loss of vision in the right eye. This man gave the following history: While squirrel hunting he fell over a cliff about twenty feet high two months previous, striking on the right side of his head. He was unconscious about two hours and then got up and walked home, which was something like a mile away, without aid. He stated there were no cuts, but a large "knot" appeared on his head just above the right ear. He received no medical treatment and in one week returned to his usual occupation which was cutting timber. He worked a few days and noticed that vision of the right eye was blurred, and the "sight" was larger than the left. His vision continued to grow worse until he was totally blind in the right eye. On examination the right pupil was about three-fourths dilated and did not react to light stimuli. This eye was totally blind, as there was no light perception. Examination of the fundi showed complete optic nerve atrophy of the right eye. The left eye was normal in every respect. Vision being 20-15. An x-ray examination was advised to try and find out if he had had a fracture, but he refused; stating that he didn't think it would do any good. Blood, Wassermann was negative. I do not think this man had a fracture, but that hemorrhage took place either in the optic nerve sheath or in the sub-dural space, exerting considerable pressure on the retrobulbar portion of the nerve. Brose states that a one-sided optic nerve lesion is due in most cases to injury or fracture involving the bony optic foramen in the sphenoid bone, or to compression of the optic nerve at this point by hemorrhagic extravasation. In these cases the ophthalmoscope during the first three to five weeks may disclose no evidence of the lesion.

The field of vision, however, where the sight has not been wholly destroyed, is apt to disclose defect, such as concentric contraction or a quadrant defect. Sooner or later the nerve head will disclose descending atrophy which the oculist can recognize. Hemorrhage into the sheath of the optic nerve in basal fracture is well known to the ophthalmologist and according to Wagenmann, due to rupture of a vessel in the optic canal or through the escape of intra-cranial blood along the optic nerve sheaths. The causal traumatism may be slight but the site is usually in the frontal or orbital region.

I believe there are a good many cases of unilateral optic nerve atrophy occur which are a result of a severe concussion to the head which causes a hemorrhage in the optic nerve sheaths, as in this case:

James Patton makes the following summary of eye findings in head injuries.

(1) The presence of papilledema, especially when associated with recent intra-cranial injuries, is positive evidence of intra-cranial injury.

(2) In cases where an extensive traumatic decompression is present, should the disc become progressively blurred, further relief of pressure should be secured.

(3) In milder cases the symptoms above referred to may be relieved by spinal puncture.

(4) Even though there may be an extensive fracture, providing there is no great destruction of brain tissue, the absence of papilledema is of very favorable prognostic significance.

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DISCUSSION

W. E. Gardner, Louisville: I had not expected to discuss this paper, but in the absence of the two men who are designated to open the discussion, I should like to express my appreciation of this very interesting and valuable paper which has been presented to us by Dr. Gunn. Dr. Gunn is situated in a community where he has considerable experience in the observation of eye conditions following head injuries. I think there is no one who can give us so much aid in attempting to arrive at a neurological diagnosis in these cases as the eye man who makes careful observations of the eye grounds and is enabled in most instances to give us a pretty fair estimate of the degree of increased intracranial pressure.

As Dr. Gunn has said, the increased intracranial pressure in these cases is due, of course,

usually to hemorrhage or some secondary inflammatory condition. Sometimes you may have intracranial pressure as the result of so-called concussion alone.

If we suspect fracture at the base of the skull, spinal puncture usually will reveal the blood in the spinal fluid. This is not always true, however, and it is a procedure that should be approached with some degree of caution, because if there should be very extensive hemorrhage, perhaps we may aggravate a condition that we would like to control. I believe the value in prognosis of the eye examination, so far as the revelation of the appearance of the disk is concerned, is of invaluable aid as has already been indicated in the paper of Dr. Gunn.

There is a tendency, I believe, among the surgeons in these cases of head injury, now, to pursue a policy of watchful waiting, we might say, in the event that the evidences of increased intracranial pressure are not great and there is no direct evidence of hemorrhage, especially when it is determined by spinal puncture.

There are other means of measuring the increased intracranial pressure by the use of the spinal manometer. This is a valuable aid, but as I have said before, the examination of the eye grounds is most important, I believe, not only to the surgeon, but the neurologist who is called in consultation. Although the neurologist is interested always in the use of the ophthalmoscope, I am sure that he should have his findings checked by the competent eye man, and all three working together, I think, frequently can outline a treatment which is perhaps the line of treatment which is safer for the patient, than if the surgeon depended on his own judgement in a good many cases without the aid of the neurological and the ophthalmological diagnosis.

Gaylord C. Hall, Louisville: I think that Dr. Gunn's paper has called attention to an important medical examination. First, I want to emphasize some of the things which he said. The first method of examination, of course, is the observation of the pupil. I agree with him entirely that fixed, dilated pupils are a bad prognostic sign. We should make these examinations, I think, frequently, in order to note the progress of the disease.

One point that I want to make now is with reference to the mydriatic employed to dilate the pupil, if that is necessary. If atropin is used, which is a long-acting mydriatic, then you will destroy the value of any subsequent observations that you may have to make on the pupil, therefore you should use an evanescent mydriatic which lasts but a few hours. Another thing to be taken into consideration is the fact that these cases are really put under the influence of morphin, and therefore the opium effect on the pupil must be noted if you see these cases several hours after the administration.

As to the fundus, my observation has been, in line with what Dr. Gunn has said, that all that we see in the first examination is possibly a stasis of the retinal veins, slight dilatation, and no alterations in the outlines of the disc. If in twelve hours these veins are more dilated or if in addition to that we begin to see a blurring in the nasal edge of the disc, that indicates an active hemorrhage, probably, or edema taking place within the skull. If this thing progresses to a frank swelling of the discs, then I think that no delay should be permitted as far as operation is concerned.

As in many other diagnostic measures, positive findings are of great value; negative findings are of not so great value.

It should be remembered, as mentioned by Dr. Gunn also, that if a patient has active bleeding from the ears and nose, you may have serious damage going on within the brain, even in absence of choked discs, which will not occur on account of the leaks present through the ears or nose. But as he mentions, in Dr. Patton's findings, if you have the development of intracranial pressure, even in the face of these leaks, it shows a very active hemorrhage.

J. A. Stucky, Lexington: I heartily commend what the essayist has said as well as the discussion of Dr. Gardner.

Unfortunately in the majority of instances in cases such as these described by the essayist the oculist is able to give very little positive aid to the surgeon, and in severe brain injuries watchful waiting, meeting clinical conditions as they develop, frequent examination of the ocular fundi, noting the first evidence of localization of the intracranial injury and resorting to surgery only when it promises relief.

Milus L. Gunn, Harlan, (in closing): You may have paralysis of the external ocular muscles, either one or any group of them, or all of them, which I did not bring out in my paper. For instance, the sixth nerve is very often injured and occasionally you will have an injury to the third nerve, which will cause paralysis of all the muscles which are supplied by it, even though the patient may not show any signs of intracranial pressure. I wish to thank the gentlemen for their liberal discussion.

Removal of Pulmonary Embolus.—Lake reports a case of embolism of the pulmonary artery in which he removed the clot surgically, but the patient died. The clot removed was about 2 inches long, and tapered from the size of the finger at one end to two small branches, about one-eighth inch across, at the other end. It showed in addition several side branches. The operation performed by Lake was the one devised by Trendelenburg.

SPINAL FUSION (HIBBS') OPERATION FOR POTTS DISEASE: EXHIBITION OF PATIENT*

By **WILLIAM BARNETT OWEN**, M. D., F. A. C. S., Louisville.

The patient before you is Mr. O. T., aged 30, occupation, clerk. Three years ago he became aware of the first symptom indicating spinal disease. He received no treatment until he consulted me about seven weeks ago.

Physical examination revealed that he had Potts' disease involving the bodies of the fourth and fifth lumbar vertebral, there being complete destruction of the fourth and about one-half of the fifth.

A Hibbs spinal fusion operation was performed, the result of which is illustrated by the present condition of the patient. He was in the hospital for six weeks, and was kept on a Bradford frame for four weeks before the operation was performed.

On admission, the patient was emaciated, weak, and had some exaggeration of the reflexes, particularly the patellar and ankle clonus. He improved considerably before the operation was undertaken. Thus far he has done remarkably well. I am not presenting the patient as cured, as I do not use that term in connection with bone tuberculosis, but his improvement has been marked.

The light so-called crutch brace applied at the hospital will be worn for about a year. The man has gained more than ten pounds in weight since entering the hospital. He has also gained rapidly in strength and says he feels perfectly well.

The main reason I am exhibiting this patient is to demonstrate that the Hibbs spinal fusion operation is really not a serious procedure, because one does not come into contact with any vital organs. The spinous process is stripped of its periosteum broken at their base, the articular surfaces are thoroughly curetted the same as would be done in producing an ordinary arthrodesis.

DISCUSSION

Orville R. Miller: I saw this patient when he first entered the hospital; he was then considerably emaciated as Dr. Owen has stated. The Hibbs fusion operation does not actually correct the existing kyphosis. During preoperative treatment, while the patient is under hyperextension on the Bradford frame, some reduction of the kyphosis may occur; but the operative procedure itself is not intended to correct the kyphosis. Favorable results have been obtained by this operation as Dr. Owen has demonstrated. The Hibbs procedure is especially indicated where the kyphosis is so great that a bone

*Presented With Patient Before the Louisville Medico-Chirurgical Society.

graft cannot be used according to the method of Albee. In the latter type of cases a graft with the proper curvature cannot be obtained from the tibia.

A splendid result has been secured in this case, and Dr. Owen is to be congratulated. I have seen several other patients upon whom he performed a similar operation and they have all improved wonderfully.

J. Garland Sherrill: This is a most interesting class of surgery, and there has been considerable discussion concerning the relative merits of the two operations in general use: viz, (1) the spinal fusion procedure devised by Hibbs, and (2) the bone graft method of Albee. In my earlier practice I performed two operations upon the spine, one for infantile paralysis in a child, who had marked discomfort from rigidity of the spine, the other for pain, the result of Potts' disease. The latter patient was referred to me for supposed disease of the kidney, but the final diagnosis was spinal tuberculosis. She had advanced tuberculosis and was a poor surgical risk. She suffered great pain, was unable to sleep and could not change her position in bed. After the operation she was free of pain, but died two months afterward from tuberculosis.

The procedure of Hibbs is probably more satisfactory than that of Albee for the reason that a secondary operation is avoided and no damage is inflicted upon the tibia in securing a bone graft. The Hibbs operation is particularly indicated in spinal tuberculosis with great pain and deformity. The procedure deserves our consideration and in certain cases undoubtedly has advantages over the Albee method.

John W. Price: I am unable to discuss Dr. Owen's report, but would like to have him explain in closing what perhaps some of us do not understand, that is the technique of the Hibbs procedure and also the indications and contraindications, and the indications and contraindications for the Albee operation.

Wm. E. Gardner: The neurological improvement in the patient before us seems to have been marked. He had evidences of paraplegia prior to the operation. His reflexes are now normal except possibly a slight ankle clonus.

Wm. J. Young: Dr. Owen's report is all Greek to me, but the fact that impresses me is that this man has gained more than ten pounds in weight since admission to the hospital. I would like to ask Dr. Owen whether the ultra-violet light is indicated in bone tuberculosis as it is in other types, whether he has used it, and what results he has obtained?

J. Rowan Morrison: The gain in weight shown by the patient seems wonderful to me. It only shows what will sometimes occur in tuberculosis. I believe complete rest on the Bradford frame explains the gain in weight. Dr. Owen

operated upon one of my patients who had pulmonary tuberculosis. Dr. Grant had removed a tuberculous kidney from the same patient many years ago. While on the Bradford frame she improved rapidly and gained in weight under the enforced rest. In a more recent case where kyphosis was marked the patient was placed on a Bradford frame, but thus far has not made much progress.

Owsley Grant: I saw this patient on one occasion with Dr. Owen because of bilateral epididymitis evidently of tuberculosis origin. I advised then that nothing be done so far as the epididymitis was concerned. The man tells us now that the epididymal inflammation has practically subsided, at least no discomfort is thereby produced.

W. B. Owen, (in closing): As Dr. Morrison has said, the patient exhibited illustrates what may occur in tuberculosis involving any part of the body. The management of these cases consists in two things only, viz., general treatment of the patient, and rest. That is why we operate, to prevent motion of the joint—just as one would collapse the lung to prevent motion. The gain in weight of this patient was the result of rest and constitutional treatment. He had the benefit of heliotherapy by general exposure three times weekly while in the hospital. We use this measure in all cases of lowered vitality whether tuberculous or not and I believe it helps materially. This man was on a Bradford frame four weeks and then operated upon. The operation did not reduce his vitality and he is still gaining in weight.

Dr. Price asked about the procedure of Hibbs and Albee. The spinal fusion operation is of greater benefit in adults than in children because ossification is more complete in adults, whereas in children the spinous processes are soft. Hibbs and Albee are excellent surgeons and are very enthusiastic about their respective operations. They both say there are no contraindications to their procedures.

Hibbs makes one incision, denudes the spinous process of its periosteum outward to the lamina, cures the articular surface and trims the fragments of bone as may be required, then places the fascia, ligaments and muscles over the spinous process as to hold them in position. The spinous processes are fractured at their bases and turned so as to produce bone contact. In extreme cases some operators perform the Hibbs operation and in addition take osteo-percostal grafts from the tibia, placing the transplants on either side on the laminae. It is claimed with these transplants much stronger fusion is secured than from the Hibbs procedure alone.

The Albee operation requires two incisions. He probably performs the operation better than anyone else can. I think the procedure employed should be the one with which the surgeon

is most familiar and from which he has secured the best results. The Albee operation involves denudation of two vertebrae above and two below the diseased area in order to extend the splint far enough in each direction to hold. Of course, ankylosis of the spine results. It is merely a question of placing a brace under the skin rather than outside. The splint remains in situ until complete fusion is accomplished. It is a radical operation but is useful in certain cases.

It is advisable to correct the deformity as far as possible on a Bradford frame by means of counter extension and hyperextension. After the spine has been made as straight as possible, a spinal fusion operation is performed, which prevents recurrence in most cases. There is no brace known that will fix and retain the spine in proper position. The Turnbuckle brace is probably the best, but it causes excoriation frequently, makes the patient very uncomfortable, and the results are not as good as with the spinal fusion operation.

DIGITALIS THERAPY*

By JOHN W. SCOTT, M. D., Lexington

It has been said that the best test of therapeutic ability is one's use of digitalis. The fact that it is a drug, difficult, in a sense, to use, and that much has been added to our knowledge of it in recent years, is the reason for the presentation of this paper. Although appreciating the importance of measures other than drugs, and of other drugs in the conditions in which it is useful, the scope of this paper will not permit the inclusion of them. Successful digitalis therapy, like that of any other drug, depends, obviously, first, upon appreciation of the conditions in which it is useful, and, secondly, upon using it in proper doses.

The picture of advanced congestive cardiac failure is a familiar one. The patient, unable to lie down, cyanosed, dyspnoeic, oedematous, perhaps with fluid in the serous cavities, the liver enlarged and tender, the urine scanty; all manifestations of chronic passive congestion of various organs. Sometimes this congestion occurs chiefly in the systemic circulation; sometimes in the pulmonary. No matter whether myocardial failure occurs in rheumatic, syphilitic, or arteriosclerotic heart disease, whether in the heart broken down by hypertension with little myocardial change, or where gross myocardial degeneration has followed coronary sclerosis; whether with normal or abnormal rhythm; whether in childhood or old age, the clinical picture is the same, essentially, the proximal cause lies in

failure of the myocardium, and digitalis, or one of the digitalis series, is the one effective drug. In case fibrillation of the auricles is present the effect is attributed chiefly to depression of the functional tissue, lowering the rate of the heart by reducing the number of impulses which come through to the ventricles.

When the rhythm is normal the case is not so clear as to the efficacy of the drug in the first place and its mode of action in the second. Both Mackenzie¹ and Lewis² held that digitalis was without effect, although Mackenzie did admit that it was useful in the presence of oedema. Abundant evidence has been adduced disproving the opinions of these eminent men, and hardly anyone today is disposed to doubt the efficacy of the drug in myocardial failure with normal rhythm. There is distinct disagreement as to its mode of action, and also as to the essential causative factors in the chronic passive congestion characterizing this type of heart failure. The explanation of this, universally accepted until recently, and still the generally accepted one, is that it depends upon weakness or lack of energy of the heart with reduction of the output per minute of the latter; that digitalis energizes the weakened myocardium and increases the minute output, thus relieving congestion and restoring the exhausted cardiac muscle.

There is considerable evidence to support this view. Wiggers³ after studying the effect of digitalis on the intraventricular pressure, concludes that it improves the contractile force of the ventricular beat, and increases the systolic discharge. Cohn and Stewart⁴, with the moving x-ray film demonstrated increased amplitude of the ventricular excursions after the use of digitalis in patients with heart disease.

Though the majority of cardiologists seems to accept this theory, there is much to be said for the concept of congestive cardiac failure and digitalis action which is held by Robinson^{5,6} and Burwell and the group of investigators working with them. They believe that the essential disorder is failure of co-ordination between the ventricles; that the cardiac output per minute is increased and not diminished; that digitalis acts as a sedative, and not as a stimulant; that it diminishes cardiac output and the work of the heart. They believe that the lower level or cardiac activity which follows is more favorable to restoration of co-ordination in the action of the two ventricles than was the previously over-acting heart.

A few of the facts which support this view are: (1) that the sitting position diminishes

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cardiac output⁸. That this position benefits congestive heart failure is well known; presumably it has the contrary effect on cardiac output. (2) Eppinger, von Papp and Schwarz⁹ have shown that in sudden cardiac failure with severe dyspnoea and pulmonary congestion cardiac output is increased, and that morphine may reduce the minute output as much as 30% and that digitalis did in one case reduce it 23 per cent. (3) Harrison and Blalock¹⁰ have demonstrated increased cardiac output in dogs with experimental pneumonia, and Harrison and Leonard¹¹ that digitalis diminishes the cardiac output in dogs. (4) Burwell, Neighbors and Regan⁷ in five normal resting adults, found after the administration of full therapeutic doses (Gms. 1.4 to 2.7) that the minute cardiac output was diminished from 20 to 35 per cent. The idea that digitalis is sedative in action is not new. Corrigan¹² (1832) thought thus of it. Stokes¹² (1853) used it as such, and Traube¹² (1861) believed that digitalis accomplished its effects by quieting the heart. (Though these observers lacked the instruments of precision available today, their observations are of interest in this connection).

The clinician cannot verify the work supporting conflicting theories and must content himself with accepting those which most nearly explain the phenomena he meets with clinically. For instance, it is difficult to think of the hypertensive individual, over long periods taking maintenance doses of digitalis with benefit, and without ultimate damage, were it an energizer and stimulant. Robinson and Burwell, and their co-workers consider this theory of congestive cardiac failure as due to the failure of co-ordination of the ventricles with increased cardiac output, and of digitalis as a sedative diminishing cardiac output, rather as a concept than as a definitely proven fact. It seems to the writer to offer an explanation of so many different phenomena that he cannot but believe that further investigation will establish it.

Whether one accepts this view or holds to the other and older one, no one today, I think, questions the value of the drug in congestive cardiac failure from whatever cause. When this has occurred with hypertension, or in thyro-toxicosis, some have considered digitalis contraindicated. In neither case is this justified. The heart muscle broken down by hypertension is benefitted by digitalis regardless of the state of the blood pressure. Lowered pulse pressure is usually present and responsible, in large measure, for the congestion phenomena. Digitalis may raise this, either by increasing the systolic or lowering the

diastolic pressure. The hypertensive patient with failing heart responds just as favorably to digitalis as does one with lowered pressure.

In thyro-toxicosis, while the drug is not as effective as it otherwise is, no contraindication exists, and it is often useful as an adjunct to measures directed to relief of the thyro-toxicosis.

If in pneumonia and diphtheria be excepted, congestive cardiac failure is a rare occurrence in infectious disease. The cardiac failure in the latter conditions is a distinctly different entity. In pneumonia, however, oxygen lack with resulting increased cardiac output and consequent disorder of co-ordination of the ventricles (Harrison and Blalock¹⁰) presents a condition demanding digitalis. It seems wise to begin its administration early with the purpose of reducing the work of the heart.

Acute myocardial failure, such as that of shock after operation or other trauma presents a picture of collapse totally different from the congestive cardiac failure we have been discussing. The pulse is rapid and small, the respiration is shallow, the skin is pale and cold, the blood pressure low, the mechanism probably of vasomotor origin rather than cardiac. The output of the heart is believed to be diminished. Our theory of the effect of digitalis on cardiac output would lead us to expect it to be worse than useless, and such has been clinical experience for a long time. Probably it has not been followed more often by disaster because the doses have been small, perhaps a cubic centimeter of a solution equivalent to the standard tincture in the vein or muscle.

In this connection the work of Marvin, Pastor and Carmichael¹³ of the Yale Medical School is of interest. After complete digitalization of thirty unselected patients previous to operation, it was found that a considerable number showed lowering of systolic pressure, and a larger number, lowering of pulse pressure during the thirty hours following operation. They conclude that there is suggestive evidence that the drug causes the precise change in blood pressure it is usually given to prevent. This seems to bear out the idea that it produces the same effect upon cardiac output as does shock, whether post-operative or not. In case the patient upon whom operation is contemplated has heart disease, digitalis is indicated or not depending upon the nature of the cardiac disorder. In patients with normal hearts there is no justification for its use, either in preparation for operation or subsequently.

When we come to consider the arrhythmias, the same situation which Lewis¹⁴ deplored in 1922 confronts us: "a profession still unable

to differentiate between one form of irregularity and another, unable to distinguish between the pulse disordered by fibrillation and the pulse scarcely disturbed by slight changes in vagal tone." Obviously, if all kinds of arrhythmia, auricular fibrillation, the different grades of block and extrasystoles, for example, are regarded only as "irregular hearts," there can be no rational treatment of any sort, and especially with digitalis, which presents its most spectacular benefits in one, and may cause disaster in others. Recognition of some forms of arrhythmia is difficult, and even impossible, without graphic means. Fortunately these forms are relatively infrequent. Interruption of sinus rhythm by ventricular extrasystoles, and fibrillation of the auricles make up the great majority of instances of irregular rhythm met with clinically.

There is rarely serious difficulty in recognizing a dominant rhythm even though frequently interrupted by premature beats. This distinguishes the former readily, in most instances, from the total irregularity of the latter. Strange to say, extrasystoles give the patient much more sense of irregularity of heart rhythm than does the really grave disorder, auricular fibrillation. The fibrillator, usually, is not conscious of irregular rhythm but only of a more or less vague distress. In fibrillation whether with or without congestive cardiac failure digitalis is by common consent the remedial agent *par excellence*. It does not restore normal rhythm but, by depressing the junctional tissue, limits the number of impulses that come to the ventricle through this tissue, thus lowering the rate of the latter from 140 or more to 70 or 80 or even less. As the ventricular rate becomes slower there is striking symptomatic relief and the irregularity is much less gross, though careful observation will still usually disclose the fibrillation.

The relief will be found to be greatest at a certain ventricular rate, usually between 60 and 80. The purpose of further treatment is so to regulate the dose as to keep the rate as near this optimum as possible.

Provided the full therapeutic dose does not slow the rate to the desired degree or does not relieve the congestive cardiac failure, it should not be increased but should be kept on a maintenance basis, rest in bed, sedatives, diuresis, and other measures being relied upon as adjuvants.

In auricular flutter, a disorder of mechanism closely related to auricular fibrillation, digitalis is to be used somewhat as in the latter. Normal rhythm is restored in this condition by the auricles going out of flutter in-

to fibrillation and thence into normal rhythm. Digitalis in flutter promotes fibrillation, and when this occurs it should be stopped abruptly. Normal rhythm in many cases then ensues spontaneously.

For extrasystoles numerous enough to cause distress, digitalis has been used by many with indifferent success but by Otto and Gold¹⁵ in one case, with abolition of the premature contractions while the patient was under the influence of the drug. Generally, extrasystoles require no treatment other than reassurance of the patient that they are relatively harmless. Unfortunately, the physician often becomes more excited than the patient over this comparatively harmless phenomenon, to the complete breaking down of the morale of both.

In alternation of the pulse, that ill-omened sign of myocardial exhaustion, digitalis is indicated whether the blood pressure be high or low.

In heart block in which there is delay in the conduction of the impulse through the junctional tissue, digitalis, which depresses conduction in these tissues, is, of course, contraindicated since it promotes auriculo-ventricular dissociation. Where this dissociation is already complete it may be used without danger and with benefit.

On account of the variations in potency of the leaves gathered under different conditions preparations of digitalis have been standardized by biological assay, and the use of standardized preparations assures at least gross uniformity of potency in different exhibitions of the drug. The measure of potency is a certain effect on the heart of the cat or the frog and one so-called cat unit is equivalent, in this system of standardization, to Gms. 0.1 (ers 1 1-2) of the powdered leaf, and to 1 c. c. (15 minims) of the tincture. (It is hardly necessary to call attention to the fact that the minim equals from two to three drops of a tincture, depending on the size of the dropper). Two of the stronger tinctures contain one cat unit in each ten minims, being fifty per cent stronger than the standard.

The choice between the powdered drug, or tablets made from this, and the tincture, and among the different preparations of these, is of minor importance. The tincture is cheap but at the same time is disagreeable in taste and less accurate in dosage when measured by dropper. Provided the preparation used is standardized, there is no advantage in the more expensive ones, and there seems to be no reason to believe that one is more irritating than another of equal potency.

For a man of average size, 150 lbs., 225 minims of the standard tincture or 22 grs. of

the leaf must be given before there is full therapeutic effect. In a sense this may be considered the dose of digitalis. Since the margin between this, the full therapeutic dose, and the toxic dose, is small, and since abnormal susceptibility to the drug is not unusual, the giving of this amount in one dose is attended by considerable danger. In what sized fractions this dose should be administered depends solely on the urgency of the condition; if the myocardial failure is severe, as much as half this amount may be given, the remainder in two or three doses at six-hour interval. All of the dose is given by Gold and Otto¹⁷ in the first twenty-four hours, none in the next, and on the third day maintenance doses are begun. Two-thirds of the dose may be given in the first twenty-four hours, the other third in the next, (Levy and Mackie¹⁶). When these large fractions of the full therapeutic dose are used, the interval should be six hours, since this is the time required for even very large doses to exert their maximum effect; a shorter interval involves the danger of giving the drug while the patient already has a toxic dose. When these massive fractions of the full dose are given, the patient must be under careful observation, and one must be sure that no digitalis has been given for several days. Unless there is some emergency, much smaller doses or rather smaller fractions of the full therapeutic dose are to be recommended since they are freer from danger. However, it is rarely the case, if a patient needs digitalis at all, that more than three or four days should elapse before 200 to 300 minims of the tincture have been given.

After digitalization has once been effected its maintenance depends upon giving each day as much of the drug as is excreted daily; the average daily excretion is 22 minims of the tincture, and consequently this is about the amount administered daily. Whether this is given in one, two or three doses is not important.

Though these figures are only approximate and, as Levy and Mackie¹⁶ point out, individual variations in absorption and susceptibility are so great that the body weight estimation of dosage of Eggleston may give a false sense of security and may not be desirable on that account, nevertheless, the average total dose, 1 c. c. (15 minims) of the standard tincture for each seven pounds of body weight should always be in mind as the guide to digitalization.

The effort to get rapid effect by intravenous use of a cubic centimeter or two of aqueous solutions, equivalent to the tincture in potency, has been discussed by Pardee¹⁸,

who found that 30 to 45 minims intravenously were required to produce evidence, of even minimal digitalis effect, and that this required five or ten hours, the same effect resulting in the same time after an equivalent amount by mouth. 5 c. c. however, of one of these preparations intravenously is safe, and can be relied on for definite effect within an hour or even less.

There are certain conditions under which it is difficult or impossible to give digitalis by mouth. Nausea and vomiting are frequent symptoms of myocardial failure demanding the drug. Some patients, especially those having once had toxic nausea and vomiting, are very intolerant of digitalis by mouth, and still a third class, those who have had surgical operations, may, in rare instances, (though never for shock), need the drug otherwise than by mouth. When digitalis is given intravenously, the low margin of safety makes effective dosage by that method undesirable, unless grave emergency exists.

In the cases mentioned, rectal administration is a valuable resource. Levy¹⁰ states that the lapse of time necessary for the occurrence of both the minimal and maximal effects on hearts in patients with auricular fibrillation, when the drug is given by mouth, closely approximates that required for similar effects when it is given by rectum, and that the dose is comparable to that employed when a large single dose is given by mouth. He uses an aqueous solution, equal in potency to the standard tincture, and of this, gives 8 to 20 c. c. in one dose. This aqueous solution is not always available, and the experience of the writer has been that 12 to 15 c. c. of the standard tincture can be given in 125 c. c. of water without producing irritation from the alcoholic content. Patients who are intolerant of the taste, and develop local gastric irritation may be carried on maintenance doses administered by rectum every two or three days.

Hypodermic or intramuscular administration is extremely irritating and may be followed by abscess. It is hardly ever the case that this is preferable to one of the three other methods referred to.

The margin of safety between the full therapeutic dose and the toxic dose is relatively small and some toxic symptoms are not unlike those which the drug has been given to remedy, for instance, nausea and vomiting, and even though rarely a very rapid pulse rate. These symptoms or the very slow pulse of partial block, or the occurrence of extrasystoles, even to the point of bigeminy, are all suggestive of toxic effects. When any of these are present the possibility of over-dosage should always be in mind. The amount of

digitalis active in the patient may be estimated by subtracting from the total amount taken, 22 minims of the tincture for each day since the administration of the drug was begun. This is very helpful in deciding whether too much or too little of the drug has been given.

SUMMARY

1. Digitalis seems to have a sedative effect, diminishing the work of the heart.

2. It is indicated in congestive cardiac failure whether with or without normal rhythm, and in certain arrhythmias.

3. It is contraindicated in shock and in arrhythmias depending upon delayed conduction in the junctional tissue.

4. Prompt digitalization is the aim of therapy and this is not attained until approximately the average body weight dose has been given.

5. Oral administration answers nearly all requirements. Rectal administration is sometimes useful.

Doses of 5 c. c. intravenously are useful for rapid effect. There is no occasion for subcutaneous or intramuscular use.

6. When toxicity is suspected, estimate of the dose active in the patient is important.

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DISCUSSION

Virgil Simpson, Louisville: The essayist's consideration of the indications for the use of digitalis are so thoroughly in accord with the consensus of opinion of all the men who are doing serious work in cardiology at the present time, that I do not wish to do more than merely emphasize my approval of what he has said. I wish to address myself, in the relatively short time at my disposal, to a consideration of the how of digitalis action. I presume that the ma-

jority of you had thought that the action of digitalis was long since settled, that the teachings concerning its method of producing its well known effects under ordinary conditions and and dosage were sufficiently well established by laboratory and clinical methods. As the essayist, however, has introduced a rather new and somewhat novel explanation upon which a part, at least, of the action of the drug may be based, I consider it of sufficient importance to discuss the soundness of his half confessed espousal of the idea of a sedative basis for digitalis action.

The pharmacological action of digitalis is not a simple one. It affects the heart muscle directly, independent of its nerve supply, the vagus nerve both centrally and peripherally and the vascular system through both its musculature and nerve supply. Its action on the heart muscle can be easily demonstrated in the frogs heart. The result is the same whether the drug is applied directly to the exposed heart, injected into the lymph sac or by perfusion through the excised heart. Polygraphic tracings show in each experiment that the muscle contractions are increased in force, slowed in rate and lengthened in time. The total output of the heart per minute is lessened it is true, but not because of sedation. The appearance of a digitalized heart is striking. It becomes smaller in bulk, the color paler and if the dosage be increased systolic standstill results, this standstill is not the result of paralysis for if the chambers be forcibly distended the organ resumes action with powerful beats. This action of digitalis occurs when the heart muscle has been deprived of all nerve connection, hence is muscular. In the toxic stage of digitalis action with fibrillary twitchings the heart stops in systole.

When experiments are made on animals with heart intact the purely muscular action of digitalis is complicated by vagus stimulation and the indirect effect of accompanying changes in the vascular system. The drug stimulates the vagus nerve which tends to slow the heart and increase the diastolic period. These are opposite effects from that of its muscular action alone. These two separate effects have added to them the indirect action of the blood vessels through digitalis action, the sum total of which represents, in man, the therapeutic effects of digitalis, viz, a slower rate, greater amplitude of contractions of both ventricles and auricles and an increased cardiac output.

In man the effect of digitalis on the blood vessels is of equal importance with its action directly on the heart. The vessels of the splanchnic are affected most powerfully and the vessels of the brain, skin and extremities may even be dilated not because of a vaso dilator action of the drug but because the peripheral vessels are less powerfully constricted and the blood is

forced into them from the more powerfully constricted splanchnic vessels. This elective action of digitalis on different muscular tissues is observed in the muscle tissue of the auricles and ventricles, the latter being more actively stimulated. The pulmonary vessels are but little affected by the drug since they are not supplied by vagal branches. Whatever increase in pressure in the pulmonary artery occurs, is the result largely of increased force in the heart contraction.

That an actual increase in blood volume flow results from digitalis can be easily demonstrated by measuring the flow in experimental animals, a method far more accurate than Burwell and Robinson's gas analysis experiments.

The pharmacological action of digitalis, then, briefly is an attempted balance between its direct effects on the muscle and the vagus action through the vascular system. Disease may alter the degree of responsiveness of one or more of this trio and hence explains the variations in action of the drug at the bedside.

Digitalis slows the heart by lowering the chromotropic or excitation function but it does this by stimulation of the vagus nerve; it exerts an inhibitory action on the conductivity or chromotropic property of the heart through its action on the auriculo-ventricular bundle. Whether digitalis block be that of bringing out a "latent" block due to myocardial disease as believed by Wenkebach or wholly through it stimulation of the vagal influence is of little consequence in the present discussion since it is agreed that systole is strengthened, hence sedation does not obtain in a pharmacological sense.

Let us consider what digitalis does with reference to the clinical conditions which the essayist mentioned. Let us take premature contractions which he unfortunately refers to as extra-systole. He does not mean that. Being the purist he is, he does not mean extra-systole. Premature contractions are the result of abnormal irritability of the myocardium or of the special conducting tissue. They are not necessarily evidences of heart disease but rather of an irritable or irritated heart. They are not, even when persistently periodic incompatible with longevity as MacKenzie reported a case seen in a man 69 years of age who had had this trouble for over 50 years. They may be either nodal, auricular or ventricular in origin, the latter obtaining about ten times as frequently as the former. Either form may be the result of digitalis overdosage. The typical bigeminal pulse is recognized as an evidence of over digitalization. In heart failure digitalis may, in some cases, induce premature contractions, while in other cases, where they already exist it may stop them. Auricular premature contractions are of more importance from a prognostic standpoint as they are

more frequently the forerunner of paroxysmal tachycardia or fibrillation. The nodal or atrio-ventricular type are rarely seen but are of interest, in this connection, because they are in reality, an escape of the ventricular pacemaker due to exaggerated irritability of the atrio-ventricular node.

Now in connection with digitalis action what conclusions are permissible? It is accepted that over digitalization may cause any of these forms of premature contractions. It is likewise an accepted fact that they occur as an expression of over irritability of the heart muscle or conducting tissue from causes other than digitalis toxicity. The corollary that digitalis increases the irritability of these structures, as expressed in terms of contractions, is obvious. If it acted as a sedative or depressor it should more uniformly relieve the condition when used as a therapeutic agent and it should not produce them when used in over dosage.

The physio-pharmacological law of stimulation preceding depression in drug action would have to be upset in the sole exception of digitalis if the doctrine of sedation were accepted.

Pulsus alternans affords another example of the clinical benefit of digitalis which would seem to further discredit the sedation theory of its effects. This is recognized as one of the most serious disorders of cardiac function; it always means exhausted heart muscle save in the single exception of its occurrence in paroxysmal tachycardia. It was taught at one time that digitalis was contraindicated in this disorder but this has been found incorrect by scores of clinicians who have systematically studied this problem. With the great War came into the literature on Cardiology a new grouping of symptoms and a new terminology. Medical men have come to speak as readily of effort syndrome, soldiers heart, neuro-circulatory asthenia as of angina pectoris or valvular disease. These are veritably "irritable" hearts and digitalis is of no value in their management. If it be truly a sedative surely it would have found a place in this therapy.

W. W. Anderson, Newport: There isn't a thing to criticize in the valuable paper of Dr. Scott, and just for the purpose of trying to re-enforce a few points, I rise on this occasion, first of all to re-enforce this point, that digitalis increases heart rest, decreases heart work. Therefore, the point of reasoning that I derive from it, that the essayist did not mention, as far as I was able to hear, is that it is well if the patient needs digitalis, to give him physical rest, also; he ought ordinarily, if there is any urgent need for digitalis, to be a bed patient, or at least a chair patient, for some of them can't lie down in bed until their circulation is restored. The general

physical rest is a part of the treatment by digitalis.

Then his suggestion of the six-hour interval between doses I think is very important. In our anxiety and earnest desire, our eagerness, to accomplish something for the patient, we are tempted to give him doses every two hours. It is a nauseating drug in taste and the effect is nauseating and the oftener we give the drug the greater that effect. If we give it at six-hour intervals we can give food and that will lessen the nauseating effect.

Give enough digitalis to get results. There is no use monkeying with it. To be sure of your ground when you are giving enough, you must watch your patient. The patient can't be given plenty of digitalis and be told to go on his way rejoicing, that is not a safe proposition, you must watch him and know when to quit or when to lessen the dose.

It is not contraindicated in hypertension if the other indications for its use are present. A failing heart, failing musculature calls for digitalis whether the failure is due to hypertension or something else. You will see hypertension accompanying Bright's disease with edema even go down under digitalis, because the water-logged system will unload its surplus of fluid and the pressure will actually fall, with benefit to the patient. Don't be afraid to give it in the presence of hypertension when it is needed.

R. Hayes Davis, Louisville: I enjoyed hearing Dr. Scott's paper very much because it is a most practical subject. After all, the treatment of heart disease settles itself down to three practical considerations, first rest, secondly modified exercise, thirdly, the use of digitalis. The use of the various other drugs that are so frequently employed in the treatment of heart diseases have as a rule very little effect and are almost useless except as aids to digitalis administration. Digitalis is by far the most important drug that can be used in heart diseases.

The treatment of heart diseases by drug therapy depends entirely upon a very careful knowledge of the use of digitalis, which is a very complicated subject and has been covered most completely by Dr. Scott.

There are a few conditions that I might emphasize and discuss a little more, in detail. First of all, we know that the congestive heart conditions are most greatly benefited by digitalis. The type of heart condition which is known as collapse, or which is brought about by shock, is not benefited theoretically. However, it is questionable whether digitalis does very much harm in these conditions, because the patient either gets well or dies very quickly; and the administration of digitalis is naturally slow in its action, and before this drug can really have much effect one way or the other the crisis is

past.

Of course this does not hold if the drug is given in very large doses intravenously. Then, as has been mentioned, it may give effect within an hour. Ordinarily, of course, the effect of digitalis is much delayed and requires a certain dosage before there is any considerable degree of effect on the heart muscle.

Auricular fibrillation is the type of arrhythmia most benefited by digitalis administration. As a rule, in many cases of auricular fibrillation it is necessary to continue digitalis administration throughout the patient's life. This holds in cases of chronic myocarditis almost invariably. In cases of myocarditis brought about as acute conditions due to hyperthyroidism and acute dilatations and certain other conditions such as toxic conditions, oftentimes after the amelioration of the auricular fibrillation, the digitalis administration can be discontinued, but seldom in chronic cases of myocarditis. If the administration is discontinued the ventricular rate increases and heart weakness returns.

In about one case out of ten, digitalis administration does not accomplish any results in these cases and it is then necessary to employ quinidin.

John Harvey, Lexington: Being associated with Dr. Scott, I have enjoyed the paper very much, and I sure that Dr. Scott has enjoyed giving this paper to us, because digitalis therapy is a subject in which he is very much interested. I have the feeling that he has been very successful in its application. He emphasized that in order to get digitalis effect, a full therapeutic dose is necessary. So often we may think that digitalis is not doing what the drug is supposed to do, and if we check up carefully we find that, for the weight of the patient, there is an insufficient amount of the drug in the body.

Dr. Scott was somewhat hurried at the end of his paper and there is one method of administration which he passed over rather rapidly that I am sure he feels is most valuable in patients who are unable to tolerate the drug by mouth, and that is the administration by rectum. He did not go into detail regarding that, but I have seen him give it to numerous patients who could not tolerate the drug by mouth, in whom full digitalis effect was obviously obtained and in whom the nausea and vomiting, which was perhaps due to the congestive cardiac failure, ceased. While this method may seem on first consideration to be rather difficult, yet it need not be repeated often, and in many instances it is sufficient to give a large dose not more than once a day and frequently it may not need to be repeated more than once every two or three days.

For rectal administration we have used the ordinary tincture diluted with water and feel

that is practically as unirritating and as effective as the aqueous solution.

John W. Scott, Lexington, (in closing): The relatively slow effect of digitalis even when given intravenously, which seems to be inferred in Dr. Davis' discussion as constituting the objection to its use in shock, is not the chief objection. It has actually a damaging effect in shock whether the effect be rapid or slow.

Fibrillation is not prevented by digitalis. The patient may not develop fibrillation while the drug is being taken and may develop it when the drug is left off, but this will be not on account of digitalis but rather in spite of it, as it produces a condition in the junctional tissues actually unfavorable to the resumption of normal rhythm. Slow fibrillation which is the rule after effective digitalis therapy in auricular fibrillation may simulate normal rhythm and prove very deceptive to the unwary.

Dr. Harvey has given our ideas about rectal administration so clearly that it is not necessary to go into that again except to reiterate that the methods which Dr. Davis considers preferable to the rectal method, namely subcutaneous or intramuscular and the intravenous ones, are not to be preferred. Subcutaneous or intra-muscular injections of digitalis should never in my opinion be used for the reasons set out in the paper. There are obvious advantages in rectal administration over intravenous in many cases, especially in view of the fact that one can approach the full indicated therapeutic dosage in one dose without danger as Levy has shown.

Dr. Stites has referred to Pardee's work, which demonstrates that, dose for dose, subcutaneous and intramuscular administration are followed by effects no more quickly than by mouth and that the minimal doses so often used are ineffective regardless of time. This fact together with the great irritation, even to abscess, if doses large enough to be effective are given in this way contra-indicates subcutaneous and intramuscular administration under any conditions.

Leprosy Being Conquered—Leprosy, the most horror-inspiring of human diseases ever since Bible times, is being knocked out by a combination of botanical and chemical research. Speaking before the Academy, Dr. Roger Adams told how chaulmoogra oil, brought to the western world by botanical explorers in the Orient, is being improved on by the synthetic chemist. The oil itself is not the thing that is deadly to the leprosy germ (it was found, but rather two natural acids which developed from it. Chemical examination of these acids showed that each was built of a five-cornered ring of carbon and hydrogen atoms, with a chain of other atoms sticking out at one side like a tail.

CASE OF MARKED ANTRAL SUPPURATION WITH A SINGLE SYMPTOM*

By **SAMUEL G. DABNEY**, Louisville.

In the majority of cases of suppuration of the antrum of Highmore, the patient presents quite a number of more or less characteristic symptoms. In the following instance there was but a single symptom.

A youth of 21, came to my office one Saturday afternoon and stated that he "had a very bad smell in his nose." When asked which side he thought was involved, he said he did not know. There was a slight nasal discharge, but he had complained of no pain. He breathed normally through both nostrils. He had never suffered from toothache, nor had any of his teeth been extracted. The interior of his nose was examined through a nasal speculum, but nothing abnormal was detected. Transillumination in a darkened room revealed a typical "dark spot" in the cheek under the left eye. His nose was irrigated and he was then allowed to recline on the sofa with head over the edge lower than his body, to insure drainage of the antrum through the nose. Within a few minutes foul-smelling pus began draining from his nose, and the diagnosis was then very simple.

The most interesting feature in this case is that the patient had marked suppuration of the antrum of Highmore without a single symptom except a foul odor in his nose, and he had no idea which side was involved.

The patient was immediately referred to a well-known Louisville dentist for examination to determine whether there was a diseased tooth root, which had infected the antrum, as that is a frequent cause of antral disease, but the dentist reported there was no trouble with the teeth.

The patient reported to the office the following day (Sunday), and I had no difficulty in drilling an opening through the antral wall with a small trephine. He was almost immediately relieved. I saw him daily for a week and the wound was kept open for drainage. The odor promptly disappeared and he has had no further trouble.

DISCUSSION

James W. Bruce: Dr. Dabney's report reminds me of a case I saw a few months ago fol-

*Read before the Louisville Medico-Chirurgical Society.

lowing measles. A child had an average attack of measles and when the rash began to fade the temperature receded and remained about normal for two days, then suddenly rose in the afternoon to 104° or 105° F. The leukocyte count was about 20,000 and we realised there must be a locus of infection somewhere in the body. I ascertained the name of the nose and throat specialist the family usually consulted, and he was asked to see the child in consultation. He reported there was some darkening of one maxillary antrum, but hardly believed sufficient trouble existed there to cause the high fever. For about ten days the afternoon temperature was 104° to 105° F., and we were uncertain just what was the matter with the child. There were really no suggestive symptoms, no tenderness, no edema, nothing to indicate a serious lesion except the daily rise in temperature. Finally the specialist decided to irrigate the antrum which showed some cloudiness on roentgen-ray examination. A large amount of pus was removed by the irrigation. I was surprised to note the rapidity with which the child recovered after a single irrigation. The fever subsided almost immediately and the child had no further trouble.

Temperature in Pulmonary Tuberculosis.—A series of fifty-two patients in various stages of pulmonary tuberculosis were studied by Funk and Gordon with special reference to the rectal temperature as revealed by a recording resistance thermometer. Assuming that rectal temperatures are generally more accurate as an index of body temperatures than are temperatures taken by mouth, the dissimilarity of temperature variations in individual patients is emphasized. The generalization that the temperature in tuberculosis patients is lower in the morning and higher in the afternoon and evening may lead to many errors in individual patients if a rigid routine of temperature observations is instituted, especially if the routine includes as few as two observations a day, as is practiced in many institutions. A simple method for temperature observations is described. Three-daily observations according to the routine are made, until the patient is accustomed to the institutional care. Then a continuous twenty-four hour record is kept, to determine the periods of maximum and minimum temperatures. If these do not occur when the routine observations of the mouth temperature are made, then a special routine is outlined for the patient, as to both the hours and the number of daily observations. At intervals of ten days or two weeks, another twenty-four hour observation is made to check the observations of the mouth temperature.

ADDRESS OF THE RETIRING PRESIDENT OF THE DAVIESS COUNTY SOCIETY*

By J. H. HARRISON, Owensboro.

Gentlemen of the Daviess County Medical Society, I want to express to you this evening my heartfelt appreciation and deepest gratitude for the confidence you have placed in me in permitting me to serve as your president during the past twelve months.

I owe much to the medical profession, here and elsewhere, for the many favors shown me. I believe that I may truthfully say that I am honored by the good will and friendship of most every member of this organization, an honor that I hold in high esteem. The doctor's life is not always strewn with roses or brightened by the golden rays of the sun, but thanks to the hand that guides our destiny, our lives are filled with sunshine and shadow, joy and sorrow, adversity and good fortune and they keep us from drifting into peaceful twilight of self-satisfaction that knows no progress or achievement. We have met with many adversities, but in spite of these we stand today as one of the highest callings. During the last decade we have been undergoing a new order of things, an age is now dawning when medicine is no longer a competitive business, but a co-operative work, for the glory of God and the benefit of mankind. We should welcome the day when we become big enough to forget all envy, strife and bigotry and extend to every one the supreme right of an opinion. Not many achievements have been attained in this world without the earmarks of an opposing force, because we differ in method or plan is no reason that nothing is to be accomplished. Conflict of judgement and clash of opinion is not the bad factor we may suppose, it is a divine way to progress.

The radical who stirs our conservatism is not always agreeable, but may prove a friend in disguise. Let us remember that the universe does not revolve around one man's opinion, nor does anyone have a monopoly on scientific truth. A method of procedure may be commonplace and seemingly insignificant, yet by it we may reach the coveted goal—results. We are well aware that many of the greatest achievements in medicine have not been characterized by skill in the use of the scalpel or a technical knowledge of our science, but by a broad knowledge of all, prompted by a divine inspiration, loyalty and honesty of purpose leading on to the great field of usefulness to God and mankind.

On an occasion of a Ministers' meeting the

*Read before the Daviess County Medical Society.

subject for consideration was Sunday trains—one divine arose and stated that he was opposed to Sunday trains and that if his family lay at the point of death and his getting to them depended on his boarding a Sunday train, they would have to die without his comforting words. Following him came a young mountainer, who said: I too, am opposed to Sunday trains, but if my wife and baby were at the point of death and I had no other way to reach them, save to use his Satanic Majesty, I would bridle and saddle the Devil himself, and ride him to my home to be of comfort to them in this trying hour. The doctor who is tied to system, who is content to say, this is the way our fathers have trod, its good enough for me, is to be pitied. To follow continually in a given path without lending an ear to that which seemeth good, may be disastrous to our subjects and a hindrance to progress. The doctor who is so narrow that he can see nothing but the glitter of the scalpel is as much of a bigot as the antivisectionist, who is opposed to the same. On the other hand, the doctor who is opposed the knife under all circumstances is a decided menace to progress.

I believe that every system of the healing art has its field of usefulness, and because it does not happen to agree with our own is no reason for condemnation. To condemn without knowledge is prejudicial and the lack of knowledge is the very foundation of prejudice. You can no more crush a scientific truth than you can exalt a fabrication, and the best evidence of virtue in a creed or system is its results and longevity.

We meet here to exchange ideas that we may be benefited by each others experience. Personally, I want to say that I have learned a great deal from my doctor friends and medical societies are a fountain of knowledge for me. I am sorry for the doctor who absents himself from his society's meetings. I fear he is not getting all out of his profession that is due him. One of the most positive evidences of deterioration in a doctor is isolation. It is impossible to keep abreast with progress without association with others.

Let us put forth every effort to make our society even better than it has been, we have the facilities for growth, we should grow. We have as good, as capable and as deserving body of doctors in Owensboro as may be found in Kentucky and we should render a great service in this field. Let us put into our work the best our energies can give, the best our intellects can give, the best our hearts can give and with an unselfish devotion to our work, let us "become all things to all men that we may by all means save some."

Again, I want to thank you and assure you

that your incoming president will have my hearty co-operation.

BOOK REVIEWS

GYNECOLOGY—By William P. Graves, A. B., M. D., F. A. C. S. Professor of Gynecology at Harvard Medical School. Surgeon-in-Chief to the Free Hospital for Women, Brookline, Consulting Physician to the Boston Lying-in Hospital.

In this volume we are given a complete and thorough presentation of the whole of gynecology. It has been brought up to date, including all that is new in methods of diagnosis and treatment. Many of the subjects have been entirely rewritten, due to the rapid advance of knowledge in the last few years. Improved and new surgical technique is fully given, making it a wonderful book for the advanced student and surgeon. W. B. Saunders Co., Publishers, Philadelphia. Fourth Edition, Thoroughly Revised. Price \$10.50.

INTERNATIONAL CLINICS—A quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Paediatrics, Obstetrics, Gynaecology, Orthopaedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners. By leading members of the Medical Profession throughout the world. Edited by Henry W. Cattell, A. M., M. D., Philadelphia, U. S. A. with the collaboration of Chas. H. Mayo, M. D., Rochester, Minnesota; Sir John Rose Bradford, M. D., London, England; Hugh S. Cumming, M. D., D. P. H., Washington, D. C.; William S. Thayer, M. D., Baltimore; Frank Billings, M. D., Chicago; A. McPhedran, M. D., Toronto, Canada; James J. Walsh, M. D., New York; John Foote, M. D., Washington, D. C.; Sir Humphry Rolleston, Bt. K. C. B., M. D., D. C. L., Cambridge, England; Sir Donald MacAlister of Tarbert, Bt., M. D., F. R. C. P., Glasgow, Scotland; Seale Harris, M. D., Birmingham, Ala.; Charles D. Lockwood, M. D., Pasadena, California; A. H. Gordon, M. D., Montreal, Canada; T. M. Devine, B. S., Melbourne, Australia; R. Bastianelli, M. D., Rome Italy, and James M. Phalen, M. D., Washington, D. C. Volume I. Thirty-eighth Series, 1928. J. B. Lippincott Company, Philadelphia and London, Publishers.

WOMAN'S AUXILIARY NOTES

JANE TODD CRAWFORD MEMORIAL FUND

As representatives of Kentucky, the statues of Ephraim McDowell and Henry Clay will be unveiled with appropriate ceremonies, on March 3rd, in Statuary Hall in the Capitol at Washington, D. C. This is a proud day for the Kentucky Medical profession for Ephraim McDowell represented not only a fine type of pioneer citizen of Kentucky but the best and the bravest of the medical fraternity of the world.

The operation known as ovariectomy was first performed by Dr. McDowell and his patient was Mrs. Jane Todd Crawford, of Green County Kentucky. This operation was performed in December, 1809 at the home of Dr. McDowell. This house still stands in Danville. All honor to brave, wise, skillful, compassionate Dr. McDowell. All honor to patient, courageous, long-suffering Jane Crawford, too. These two stalwart souls opened the way for safe, surgical relief for numberless women afflicted with a heretofore hopeless malady.

When the Ephraim McDowell monument erected by the Kentucky State Medical Association, was dedicated in Danville, May 1879. Dr. Samuel Gross, the orator of the occasion, suggested that a monument be erected in memory of Jane Crawford, emphasizing that this should be done by "women everywhere" as a tribute from them to this noble heroine.

That was almost fifty years ago, but no definite steps were taken toward this end until September 12, 1928, when the Woman's Auxiliary to the Kentucky State Medical Association assembled in annual session at Richmond, voted to start a fund for a Jane Todd Crawford Memorial.

Ten members each contributed one dollar at once, so that our fund dates from September 14th, 1928. Now, that fund has doubled itself and we have twenty dollars, deposited at interest for the Jane Todd Crawford Memorial fund.

The committee appointed by our president, Mrs. J. T. Reddick, to develop plans for raising the fund, consists of the following members: Mrs. Graham Lawrence, Shelbyville, Mrs. V. A. Stilley, Benton; Mrs. Wm. M. Martin, Harlan; Mrs. P. E. Blackerby, Mrs. Irvin Abell and Mrs. A. T. McCormack, of Louisville, with Mrs. McCormack, chairman.

This committee requests that each County Auxiliary contribute as large a sum as possible to this fund before the next annual meeting of the State Auxiliary in September. Checks should be sent to Mrs. W. G. Salisbury, Treasurer, 532 West Main street, Louisville, Kentucky.

Each auxiliary will doubtless, raise its funds in its own individual way, but as several

requests for suggestions have been received, the following list of possible ways of raising money is given.

- a. A silver tea with the story of Jane Todd Crawford read or told by one of the members.
- b. A public lunch or dinner served on court days or other occasions.
- c. Food sale.
- d. Flower sale.
- e. Rummage sale.
- f. A musical entertainment.
- g. A short play.

OLDHAM COUNTY MEETS

The Woman's Auxiliary to the Oldham County Medical Society met Friday afternoon, January 25, at the home of Dr. J. W. Sams and Mrs. Sams in Crestwood, with eleven present. Following the business meeting, Mrs. Sams gave a report of the Southern Medical Auxiliary, which met at Asheville, North Carolina, in November, 1928, and announced that the 1929 meeting will be held in Miami, Florida, next November. The American Medical Association and its auxiliary, our national body, is to meet in Portland Oregon in July.

Mrs. A. T. McCormack, of Louisville, talked to the ladies about the proposed study course which is being prepared for the county auxiliaries on the "Medical and Health Laws of Kentucky"; also of the Jane Todd Crawford Memorial fund. A social hour followed with "The Medical Trunk" contest, and refreshments. The meeting then adjourned to meet in March.

Respectfully submitted,

MRS. S. J. SMOCK,
Secretary.

JEFFERSON COUNTY CARD PARTY

A bridge party was given by the Woman's Auxiliary, Jefferson County Medical Society, on Friday afternoon, February 1st at the Woman's City Club, Henry Clay Hotel, Louisville. This was a successful party and the auxiliary was made very happy over the proceeds resulting.

This money was raised for our contribution to the State Auxiliary and for a party to be given at Easter time for the children at the City Hospital and the Crippled children of the Kosair Hospital.

MRS. D. A. BATES, Secretary.

McCRACKEN COUNTY MEETS

The January meeting of the Woman's Auxiliary of the McCracken County Medical Association met with Mrs. J. B. Acree on Friday afternoon, January 11th, at her home on West Broadway, Paducah.

The president, Mrs. J. T. Reddick, presided and had on display the "Scrap Book" on which

she and her committee have worked most enthusiastically.

The auxiliary discussed plans for Spring-health work, and decided to continue its program of health education by asking the State Board of Health to conduct a health clinic in Paducah in the near future—and by placing a year's subscription to "Healthy Land" in each of the ten grade schools of Paducah.

The "Healthy Land" subscriptions are gifts from different members of the auxiliary, with Mrs. C. P. Burnett, chairman.

Mrs. A. I. Covington and Mrs. J. B. Acree were asked to make the necessary arrangements for the health clinic

The auxiliary decided to study the Public Health Manual at the regular monthly meetings.

At the close of the meeting, Mrs. Acree assisted by her little daughter, Molly, served tea.

The February meeting will meet with Mrs. O. R. Kidd at her home on North Fifth street.

A. M. ACREE, Secretary.

BOOK REVIEW

CERTIFIED MILK. Proceedings of AMERICAN ASSOCIATION OF MEDICAL MILK COMMISSIONS, Inc. and THE CERTIFIED MILK PRODUCERS' ASSOCIATION OF AMERICA, Inc., CALIFORNIA MEDICAL MILK COMMISSIONS AND METROPOLITAN CERTIFIED MILK PRODUCERS, 1927.—This volume contains the committee reports of the various organizations and reports on their meetings held during 1927. Of particular interest to physicians are the papers on "Routine Throat Examination as Found in the Examinations of Employees on Certified Milk Farms," Dr. C. G. Saelhof; "Work of a Medical Milk Commission, Its Responsibilities and Obligations to Producers" by J. W. Van Derslice, M. D.; "The Feeding of Dairy Cows and Their Need for Vitamins," Prof. E. S. Savage, Cornell University; the general discussion on "B. Abortus," and "Milk in Infant Feeding," by Paul G. Shipley, M. D. Johns Hopkins Hospital.

STRICTLY PRIVATE—Dr. Maurice Chideckel—The Stratford Company, Boston, Massachusetts, Publishers. Price \$2.50.

An interesting description of a doctor's daily life. The tragedies and the comedies that are being daily enacted at the bedside, in the wards, and the dispensaries, in the insane asylums, and behind the doors of the consul-

tation room, are depicted with vivid realism in this book.

COMPILATION OF DIETS—California State Dietetic Association, Elizabeth Hayward, 2826 South Hope Street, Los Angeles, 1927. 70pp., leather binding. Price \$5.00.

The Compilation of Diets by the California State Dietetic Association is a very convenient and practical manual. It contains diet lists besides many useful recipes for all conditions treated by dietetics. The book is put up in a form for ready reference. There are many things that can be conveniently found there that would consume considerable time in searching through the larger and more comprehensive books on dietetics. Its great value to the busy doctor lies in this fact that he can so readily turn to it and find just what he wants. It is revised yearly by the California State Dietetic Association and being in a loose leaf form can be kept up-to-date. This gives manual an added value in keeping one from falling behind in this important line of treatment.

CLINICAL MEDICINE—By Oscar W. Bethea, M. D., Ph. G., F. C. S., F. A. C. P.

Professor of Therapeutics, Tulane Graduate School of Medicine. Professor of Clinical Therapeutics, Tulane School of Medicine, Chief of Medicine, The Baptist Hospital, New Orleans, Senior Visiting Physician, Charity Hospital of Louisiana, Medical Director of the Standard Oil Company of Louisiana.

The author's aim in this volume is to give the latest information as to diagnosis and treatment of about one hundred of the most common diseases of Internal Medicine as encountered in the greater majority of cases in homes and under conditions offering limited facilities. This presentation of the subject fills up the gap existing between the great modern systems of medicine which give nearly all of the present knowledge of disease and its management together with much theory and the condensed single volume treatises which give merely the essence of the knowledge of a large number of conditions. A book especially suited to the needs of the general practitioner. W. B. Saunders Co., Publishers, Philadelphia. Price \$7.50.

Kentucky Medical Journal

Published Monthly By
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Incorporated

Entered as second class matter October 22, 1906, at the Postoffice at Bowling Green, Ky., under act of Congress, March 3, 1879.

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COUNTY SOCIETY REPORTS

Madison: The annual meeting of the Madison County Medical Society was held December 20th, 1928, at Hotel Glyndon, where dinner was served to the doctors and members of the auxiliary.

The following officers were elected: Dr. R. M. Phelps, Union City, President; J. A. Mahaffey, Richmond, Vice-President; and J. G. Bosley, Richmond, Secretary.

Dues were collected and a check forwarded to the State Secretary.

J. G. BOSELEY, Secretary.

Trigg: The Trigg County Medical County reorganized December 19th, 1928, with six out of the nine physicians in the county being present. The Society is to meet monthly. Those present were: Drs. J. R. Boatwright, President; J. E. Wall, Vice-President; H. L. Wallace, Secretary; N. C. Magraw, John Futrell and H. H. Bishop.

H. L. WALLACE, Secretary.

Daviess: The annual meeting of the Daviess County Medical Society met December 11th, 1928, at the Georgianna Tea Shoppe, Owensboro, Kentucky for the election of officers and a luncheon.

The annual dues were collected from those present and a check forwarded to the State Secretary.

Dr. E. Darwin Smith presented a paper on "Cesarean Section."

The following members were elected: Dr. W. B. Negley, President; Dr. S. P. Oldham, Vice-President; Dr. S. E. Hainline, Secretary-Treasurer; Dr. P. D. Gillim, Delegate and Dr. C. M. Rice, Censor.

S. E. HAINLINE, Secretary.

Adair, Green and Taylor: The annual banquet of the Medical Societies of Adair, Green and Taylor counties, was held in Campbellsville, Ky., December 6th, at 8:00 p. m. The meal was prepared by the class in domestic science of Campbellville College, and served in the West Room of the dormitory. Between courses entertainment was provided by members of the class.

Dr. Granville S. Hanes, President-elect of the State Association, and Dr. Arthur McCormack were guests of honor for the occasion.

Both made most excellent addresses of practical interest. Dr. McCoy and Mr. Blackerby also made short talks.

Besides regular members of the society, Drs. McChord, Crenshaw and Wilbur, of Marion county aided materially in the success of the meeting.

W. B. ATKINSON, Secretary.



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So into his training passed the long discipline of study and preparation, together with that more rigorous responsibility to answer the summons when duty calls, whenever, wherever or for whatever the need may be.

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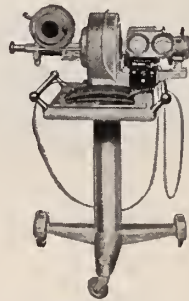
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Published Under the Auspices of the Council

VOL. XXVII.

BOWLING GREEN, KY., APRIL, 1929

No. 4

EDITORIAL

POST GRADUATE COURSE

Plans are now in preparation for the second Post Graduate Course under the auspices of the Kentucky State Medical Association to be held in Louisville for two weeks beginning July 8th.

There will be some changes in the subject matter and the personnel of the teaching staff so as to bring before the doctors new subjects of interest. In the main, however, the course will follow the lines which proved so acceptable to the large number of doctors who were in attendance last year and who were enthusiastic over their work.

Doctor Philip F. Barbour has again been appointed to arrange the details of this course. He will welcome any suggestions that may be offered and may be able to arrange for additional special lectures along outside lines if there should be sufficient demand.

Begin now to plan for this vacation and you will have a good time meeting your old friends, and you will return to your work refreshed and with new clarifying ideas that will lessen the drudgery of every day work by the stimulating effect of new viewpoints.

A SURVEY OF BEAVER DAM

Under the supervision of the full time health officer of Ohio County, Dr. H. W. Terrell, the sanitary inspector, Miss Margaret Marks, had made a sanitary and health survey of Beaver Dam. It has been printed and circulated by the Chamber of Commerce of that progressive little city.

It states the physical facts, gives an analysis of the vital statistics goes into considerable detail about Typhoid, Small Pox, Scarlet Fever, Tuberculosis, an analysis of the water supply, food handling establishments, drainage and concludes with the following summary which may be used to advantage by other county health departments, adapted to their local needs:

1. The reporting of communicable diseases should be improved. All these cases are not being reported as required by law.

2. Everyone who desires the fullest pro-

tection against typhoid fever should be immunized.

3. All persons who have not had smallpox and those who have not been vaccinated within recent years should be vaccinated.

4. All children under six years of age should be immunized against diphtheria. All above that age should have the schick test made and if found susceptible should be immunized against diphtheria. Consult your family physician.

5. Immunization against scarlet fever is recommended for consideration when an epidemic threatens.

6. Annual health examination by family physician is recommended as the most outstanding forward step waged against tuberculosis.

7. Replacing the dug well by the drilled well or city water whenever possible, protection from surface contamination by means of concrete platforms, and testing of water is strongly advised. Test will be made free by Ohio County Health Unit.

8. For the disposal of body wastes the septic tank or the pit privy as recommended by the State Board of Health should displace the surface privy. Plans and specifications may be obtained through this office.

9. No persons should be employed in food handling occupation if they have had typhoid fever, until it has been proven that they are not a typhoid carrier.

10. We recommend that the town purchase a parcel of ground at least one mile from town to be used for the dumping of rubbish, this ground should be located so as not to create a public nuisance and which may be safely burned over.

11. All ditches should be kept open so as to drain properly at all times.

12. That all persons use more milk and that children drink at least one quart every day. That the milk supply be made safer by complying with the standard milk regulations as set forth by the State Board of Health.

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians will hold its Thirteenth Annual Clinical Session in Boston, April 8-12. Dr. Charles F. Martin, Dean of the Faculty of Medicine, McGill University, is President of the College this year, and Dr. John H. Musser, Professor of Medicine at Tulane University Medical School is President-elect and will be inducted in the Presidency toward the end of the Boston meeting. Dr. James H. Means, Jackson Professor of Clinical Medicine at Harvard Medical School and Chief of the Medical Service at the Massachusetts General Hospital is General Chairman of all Boston Committees having charge of arrangements for the Clinical Session of the College in April.

The program provides hospital visits, clinics, demonstrations and ward-walks during the forenoons at fifteen different Boston hospitals, and for general scientific sessions each afternoon and evening in the Assembly Room of the Hotel Statler, which will be headquarters. Eminent authorities in their special lines will present the results of their work before an audience competent to appreciate the value of the contributions.

A Symposium on Deficiencies will take place the first evening of the session, and will be of particular interest because of the fact that deficiencies are nowadays assuming a far more wide-spread and important role than had heretofore been anticipated. They have come into their own as factors producing acute and chronic disease on a par perhaps with infections. The committee has secured for the program men who can speak with authority on a variety of aspects of this important subject.

Another special feature is a review of the present status of Vaccine and Serum Prophylaxis and Therapy, designed to give the Internist a rapid survey of the field. The speaker, Dr. Benjamin White, of Boston, is an authority on these subjects and can give the high spots in rapid and yet forceful fashion.

The annual banquet of the College will be held Thursday evening, April 11, when Dr. George E. Vincent, President of the Rockefeller Foundation, will deliver the chief address. The Convocation, for the conferring of Fellowships, will take place Friday evening, April 12. Dr. Charles F. Martin, of Montreal, will deliver the Presidential address.

Programs and details concerning reduced fares, admission, etc., may be secured from the Executive Secretary, E. R. Loveland, 133-135 S. 36th street, Philadelphia, Pa.

OFFICIAL ANNOUNCEMENT

Treasury Department

Internal Revenue Service, Collector's Office
The District of Kentucky

Louisville, Ky., February 13, 1929.

To Persons Registered Under the
Harrison Narcotic Law,
District of Kentucky.

Sirs:

In view of the provisions of Article 39, 72 and 73, of Narcotic Regulations No. 5, any person registered under the Harrison narcotic law who removes his business from the place specified in his last application on Form 678 or 678-A and stated in his special-tax stamp, to another address, or discontinues a class of business indicated on unused official Order Forms For Opium, Etc., in his possession or under his control, should forward within the calendar month in which such transfer or discontinuance occurs to the Collector of Internal Revenue of his district for cancellation all such unused official Order Forms For Opium, Etc., as merchandise requested on an order form may be sent only to the person designated by the Collector and at the location specified by him on the order, and an order carrying any alteration or change of any description may not be filled.

Respectfully,

ROBT. H. LUCAS,
Collector.

Plasmochin in Treatment of Malaria.—Of 100 malaria patients treated with compound plasmochin, fifty-one were infected with *Plasmodium falciparum*, forty-two with *Plasmodium vivax*, six with mixed forms and only one, a child, aged 3, with *Plasmodium malarine*. This is the most uncommon type on the Caribbean coast. In only one case did vomiting occur. Gastric pains and facial cyanosis were also comparatively rare. In ten patients the Wassermann test changed from positive on admittance, to negative seven days after starting the plasmochin treatment. Plasmochin and quinine sulphate together proved more successful. The action is almost immediate on the plasmodia in the blood stream. As it does not act on the uterine muscle, plasmochin seems specially indicated in pregnant women with malaria. It is also valuable for use in hospitals and field treatment on a large scale. As the drug occasionally depletes hemoglobin, iron treatment seems advisable during the interval.

ORIGINAL ARTICLES

ADDRESS AT THE UNVEILING EXERCISES OF THE STATUES OF DR.

EPHRAIM McDOWELL AND

HENRY CLAY*

By HON. RALPH GILBERT, Member of Congress

Reverently, in the presence of these mighty shades, we, commissioned by the proud commonwealth of Kentucky, consign to this Hall of Fame two of her sons worthy to be placed here among the immortals.

From the selections here we are persuaded that a partiality exists among men for those who have distinguished themselves in combat either on battlefield or in legislative forum.

Kentucky bows to none in the prowess of her warriors. "The dark and bloody ground" was both a description and a prophesy. Chivalry and romance brighten every page and tragedy darkens every chapter of her history. The adventures of Boone, Kenton, Harrod and Logan are the inspiration of every American boy. The daring of Clark at Vincennes, Shelby at Kings Mountain, Johnson at Tippacanoe, Taylor at Monterey and Morgan on his raids, thrill all who love men of blood and iron, valor and action.

Kentucky's statesmen have been as able in peace as her soldiers have been mighty in war. Menifee, Knott, Crittenden, Beck, Carisle, Breckenridge and Clay assumed commanding influence in the councils of the nation. After Clay, of whom you have just been so eloquently told, had with one hand on the shoulder of the southern slave-holder and the other on the shoulder of the Northern abolitionist, averted the Civil War for a generation, it was Kentucky that, in those dark days of fratricidal strife gave unsparingly and impartially of her sons to both sides and gave Abraham Lincoln to the North and Jefferson Davis to the South, each to guide the destinies of a separated nation. While Pennsylvanians fought side by side for the North and Tennesseans side by side for the South, Kentuckians fought face to face, some for the North and some for the South.

Kentucky's list of eminent divines includes Bascom, the greatest Methodist orator; Broadus, the greatest Baptist scholar; Breckenridge the greatest Presbyterian theologian; Campbell, the great founder of the disciples and Spaulding, the greatest of Catholic historians.

As these great statesmen and preachers swayed the nation with their eloquence,

Prentice and Waterson lashed it with the power of their editorials.

Kentucky's jurists have been as outstanding as her statesmen. The learned and classical opinions of Robertson, Miller and Harlan have been read and followed in the Courts of the world. Kentucky today leads the States in the number of Justices of the Supreme Court of the United States. She has two which is more than forty-two States combined.

What giants in the Court Room were Davies, Marshall, Hardin, Wickliffe, Goebel and O'Dougherty!

Did poets ever sing more sweetly than her sons, Staton in the "Moneyless Man" and O'Hara in the "Bivouac of the Dead"?

Her painter was the matchless Jouett; her sculptor, the incomparable Hart.

Oh, Kentucky! the Mother of Genius, had your sons dwelt elsewhere, their praise would have been heralded by a thousand messengers. As the name America is an injustice to Columbus, so in this very Hall has your own son lost the credit that was his through your modesty. Why have you not sung of your doctors? In your starry Heaven of achievement, here is your brightest constellation.

When the tread of the warrior has passed on, the hurrahs and shouts are hushed, the strains of martial music have died away, can be heard the sob of the widow, the wail of the orphan, the groan of the dying as pestilence and famine stalk through the land.

What a relief to leave the scene and enter with the doctors into a field of human service aiding to rise, not to fall, helping to live, not to die. In this field have your sons surpassed all the rest. You have had five presidents of the American Medical Society, which is many more than any other state. What soldiers of daring, what masters of skill, what giants of brain were these men of mercy.

This is a fitting time to mention a few of your greatest. Brashear, McDowell, Dudley, Drake, Yandell, Gross, Blackburn, Sayre, McMurry, Matthews, Gilbert, McCormack and Abell. Two of these performed successfully feats never before accomplished in all the world. Dr. Brashear was the first surgeon in the world to have the courage and the skill to amputate the leg at the hip joint. Dr. McDowell was the first surgeon in all the world to cut into the abdominal cavity and remove an ovarian tumor. He is the father of ovariotomy and the pioneer in abdominal surgery. Dr. Brashear's feat was performed in 1806; Dr. McDowell's on December 13, 1809, both in the back woods of Kentucky. I have never held proximity to brick and mortar necessary to greatness.

*Delivered at the Hall of Fame, Washington, D. C., at the Unveiling of the Monument.

"What though on common fare they dined,
Wore hoddens grey and a'that
Give fools their silks
And Knaves their wine
A man is a man for a'that."

Dr. McDowell was born, November 11, 1771 in Rockbridge county, Virginia, son of Samuel and Mary McClung McDowell. He was married to Sarah Shelby, daughter of Governor Isaac Shelby. He was the ninth of twelve children. His ancestry were Scotch on both sides. Though a Virginian by birth, he was a Kentuckian from childhood, having moved to Danville when only thirteen years of age. Kentucky was then a wilderness and that now splendid city of Danville was a pioneer village of three hundred people, nestled in the forests of oak and poplar. His father, Samuel McDowell was Judge of Kentucky's famous Land Court and of sufficient affluence to educate Ephraim in the universities of America and Scotland. Edinburg was then the medical center of the world and to the great University there, young McDowell was sent. His inspiration, however, was received at the feet of a private tutor, who fired his imagination with the possibilities of removing diseased female organs from the vital cavities of the human body. This was Dr. John Bell, of Edinburgh, who dreamed of but never attempted these operations.

Perhaps it was the backwoods setting, the heroic environment, the very necessity of the thing, that gave Dr. McDowell, then recognized as the leading physician and surgeon of the South and West, that undefinable resignation of mind and soul that precedes an entry into the unknown. Columbus was the most skillful navigator of his time, he had studied deductions from all the known facts, he was inspired by a resigned faith. McDowell possessed the same qualities of mind and soul and as Columbus sailed into the unknown areas of an uncharted sea, McDowell entered into the unknown secrets of a human life.

The circumstances were these: Jane Crawford, a woman in the prime of life who lived in Green county, Kentucky, was suffering what were supposed to be the pains of childbirth. As time and suffering went on without apparent progress, Dr. McDowell was called into the case and rode horseback sixty miles through the wilderness to her bedside. A thorough diagnosis, an explanation to the attending physicians preceded the ordeal of telling the unhappy woman of her fate. It was fully explained to her that those pains, similar to labor pains, came from an ovarian tumor, that they would increase until death, shortly, would relieve her of her agony. Such then was the unhappy state of suffering womanhood.

Dr. McDowell in that crucial situation rose to sublime heights. Here was the problem whose solution Bell had dreamed of, McDowell was called upon to meet. Had he been in Philadelphia, then the medical center of the United States, learned doctors would have cautioned against his rashness; would have explained that the woman would in all probability not survive the operation; that he, having caused her death in a foolhardy attempt to do that which never before had been attempted, would naturally be censured as a man and probably disgraced as a physician, and he having shifted responsibility might have faltered.

Who will contend that the back woods did not play a part in this achievement; that a kind Providence, who tempers the wind to the shorn lamb, did not arrange that this woman should be the bravest of her race to meet the most daring and skillful surgeon of the age.

Dr. McDowell told her that he would, if she desired, remove the diseased parts with the knife; that it had never been done before; that death would follow failure; that she must come to Danville and submit to the ordeal without even a local anaesthetic for even morphia was then unknown.

In a few days she came on horseback, sixty miles, every step an agony. Do you daughters, with the comforts and luxuries of today realize and appreciate the hardihood, bravery and sacrifice of your mothers? Are you proud of this great heroine of the back woods? The operation was performed, success crowned the effort and forty years were added to the life of this woman. It has been calculated that to now at least thirty thousand years of pain have been in this way saved suffering womanhood.

Oh! Napoleon where are your achievements? Every year of life you took from man, this physician has added to woman. Oh, victories of war, how much greater tower the victories of peace!

Some would give to Jane Crawford, an equal part of glory in this event. Surely in courage she bears the greater part but McDowell added to courage, knowledge and skill.

When the intelligence of this great accomplishment reached the Universities of Philadelphia and Europe, it was sarcastically dismissed as untrue and impossible but three repetitions by this wonderful physician, prior to 1820, brought apologies and recognition.

Dr. McDowell was unassuming and kindly, always interested in the smallest concern of his associates. He was criticized for lack of dignity and reserve by those who know not that simplicity is the companion of greatness.

McBeath's master piece of fame,
"Do dreams of fame thy restless soul engage?"

With sword or pen thou canst inscribe thy
name

Upon the brow of Envious Time himself
And bid defiance to his blighting breath;
But thou must first build 'round thy human
heart

An adamant wall, impregnable alike
To Love's sweet smile or Pity's tear,
On the altar of thy purposes lay
Freedom and ease and rest and calm content—
The joys of home, hope, happiness, and
Heaven;

And when thou'st reached the lonely mountain
top

And stand at sunset by the glittering thing
For which thou'st left the peaceful vale
below,

Thou'lt find the brightness that had lured
thee on

Above the dear companionship of men
Was but a mocking gleam of chilling light
Reflected from some bleak and icy cliff
That frowns above eternal fields of snow." never applied to him.

Greatness must ever be accorded men,
measured by their supreme accomplishment.
—Poe not by his intemperance but by his
"Raven;" Bunyan, not by his dissoluteness,
but by his Pilgrims Progress; Clark not by
sulliness, but by his capture of Vincennes;
and McDowell not by his indifference, but by
his Ovariotomy.

These great accomplishments measure the
capacity of the man,
"Like some tall cliff that lifts its awful form,
Swell from the dale and midway leaves the
storm,
Though rolling clouds around its breast are
spread,
Eternal sunshine settles on its head."

May I add my humble judgement to that of
the able committee who selected Henry Clay
and Dr. Ephraim McDowell and to that of
Kentucky Legislature who approved their
finding that among all Kentucky's noble sons
and daughters, these should represent her
here and these statues like their lives, both
remind us,

"We can make our lives sublime
And departing leave behind us
Foot-prints on the sands of time."

Corrective Device for Soft Tissue Contraction.

—The corrective device described by Masland is
intended to exert a gradual elastic stretch on the
contracted soft tissues of either a knee joint or
an elbow joint over a sufficiently prolonged
period of time. The device will give either
simple flexion, or flexion with extension.

THE ADVANTAGES AND DISADVANTAGES OF THE COUNTY AS THE UNIT FOR HEALTH ADMINISTRATION*

By MILFORD E. BARNES, M. D., Dr. P. H.,*

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In discussing the most advantageous unit for health administration, much depends upon the scope of the health work proposed. For the purpose of this discussion it is assumed that a health work adequate to meet the needs of the community served is contemplated.

In recent years there has been a marked change in conception as to what constitutes an adequate health work. Briefly, it may be stated that a properly conducted health department is responsible for diagnosing the health needs of the community it serves, and of developing such activities as will meet those specific health needs. These activities are designed to protect the public health against conditions which offer either an immediate or remote menace. The discoveries of the past half century as to the modes of transmission of disease, and as to the influence of various factors upon health, have expanded considerably the field of preventive medicine. Whereas, for example, fifty years ago water supplies were held chiefly responsible for the spread of typhoid fever, in recent years it has been found that milk and various other foods offer excellent vehicles for its transmission. The importance of the individual carrier is being more and more recognized. Moreover, the means of rendering an individual immune have been discovered. A similar wider conception of the problem of control has been developed with regard to certain other diseases, notably diphtheria. Control measures for diphtheria are not considered complete today unless they include the immunization of susceptibles. Diseases hitherto unrecognized have been differentiated, e. g. botulism, which has been spread by improperly canned food stuffs; tularemia, which may be spread to man by infected rabbit meat; and the fever caused in man by the *Brucella abortus* of cattle. The influence of diet upon health has been more clearly recognized as the result of experimental study of various foods, and the term "vitamin" has become a common word in conversation. These studies on diet have opened up a whole field and will no doubt have a profound influence upon our general conception of the whole public health problem.

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The extensive studies on bacteriophage may cause us to revise some of our ideas on sanitation. The possible late results of hidden foci of infection and of the acute diseases of childhood are being more clearly understood. The influence of prenatal conditions upon the welfare of the offspring, is being recognized more fully. Even with our present inadequate knowledge, it is evident that health work, if it is to meet at all adequately the health problems of a community, must begin with the prenatal period and follow the child through infancy, early childhood and adolescence, endeavoring all the while to safeguard life in all these periods from those preventable conditions which threaten it immediately, or which will lead to impairment in later years. The golden day when disease may be absolutely controlled has not yet dawned, but it is appreciably nearer than it ever has been in past ages.

Health work, as thus conceived, requires the whole-time service of an especially trained staff. It follows that the unit of health administration must be sufficiently large to permit financial support without too heavy a burden upon taxation.

Involving as it does work which so closely and intimately affects the individual, the unit of health administration must not be so large as to prevent the staff from knowing intimately the local needs. This would appear to limit the area and the population group to a size with which one unit of staff can conveniently deal. Fortunately, in many states the excellent roads and the omnipresent automobile have very considerably enlarged the area which one person can cover.

However, the area must not be so large as to prevent the community from having a vital interest in the health activities conducted, and an appreciation of their value, otherwise local interest may easily be lost. Without local interest tax appropriations are with difficulty secured and maintained, and the permanency of the entire work may be jeopardized.

Finally, inasmuch as local tax levies are confined to legally defined areas, it would seem reasonable that health work, much of which is primarily of a local nature, should be delimited by similar legally defined boundaries. It is true that disease recognizes no such boundaries and that in dealing with epidemics these legal boundaries offer an obstacle only to those endeavoring to effect control. However, under our system of government these boundaries must serve as limits to health organization.

The legally defined areas which may be considered in this connection are the nation, the state, the county, and the purely local

areas such as cities, towns, and townships.

Although, theoretically, a national health service might offer many advantages, in this country the difficulties of effecting such a service or of operating it appears at present insuperable.

A state health service is possible of realization. In fact, some of our states have what approximates such a service. The advantages of at least supervisory control by the state are obvious. There is no doubt that it tends to produce that uniformity of procedure and enforcement which is so urgently needed in dealing with certain health problems. Thus, in dealing with stream pollution by municipalities or by industries, the impounding of waters in malarial regions, the enforcement of pure food regulations, and even the enforcement of pure milk regulations, state action appears to be essential to the fullest success. However, the state is too large to permit detailed knowledge of local conditions or to be influenced by the interest created in local communities. Its very uniformity tends to produce inequalities and even injustice when applied over so large an area. Progressive communities may be held back by less progressive communities, and may even have their health work crippled by the apathy or hostility of other communities. The unequal distribution of state funds which is required by the inequality of communities with respect to their health needs offers an obstacle. Generally speaking, it would appear that the decentralization of health administration which has been adopted in most states has been a wise procedure.

The purely local areas, such as cities, towns, and townships, have made various attempts to solve their health problems, so that such efforts have long been recognized as a part of local government. Cities of sufficient size require, and in a large number of cases maintain, some sort of a health service. Small towns and even in some instances, townships have appointed their own health officer. Although the town and township health officers, drawing a normal remuneration, have frequently rendered outstanding service to their communities, it is manifestly impossible for such a system of organization to meet at all adequately the real health needs of a community. No constructive or sustained health program can be developed under such an arrangement, and in practice it has served to bring the health work into a certain measure of disrepute. Under this system, rural communities as a rule, have been grossly neglected.

There remains to be considered, the County as a unit for health administration. It offers many distinct advantages for this purpose.

1. First, it affords a logical base for opera-

tions.

The County is a legally defined area. It is an auditing unit for taxation purposes. Speaking generally, it includes a sufficient number of people and a sufficient tax duplicate to permit financial support of the work without causing a heavy burden upon the tax payer. As a rule, the county is not too large for a health department to cover; nor too large to permit the development of intense local interest; nor too large to permit the health authorities to know intimately the local needs. Furthermore, under a county system of organization, service to the rural population is possible. A county-wide organization places the health administration upon a plane comparable with other recognized governmental activities. If it is logical to have a county superintendent of schools to supervise the efforts to combat the ignorance of the community; if it is logical to have a county sheriff to guard the community against crime; it is equally logical to have a county health officer to guard the community against conditions militating against its health.

2. It is practical.

If we consider, for example, the control of communicable disease, it is obvious that the larger the area brought under uniform control, the greater are the chances of effecting complete control. In a county which came to the writer's attention recently, there occurred a case of small pox which resulted in the death of the victim. Before the nature of the malady was known, 45 persons large and small had been in the sick room of the patient. They had soothed his brow, had caressed him, had surrounded him with all of the affectionate care which children and grand-children could give to a much loved member of the family. Only five of this number had ever been vaccinated. These people came from villages and farms scattered over the entire county. This case occurred in a rural township. There are 20 townships and 19 incorporated towns in the county. If there had been only local health officers over each town and township, it would have been necessary for the first health officer concerned to have got in touch with a large number of other health officers to have effected control. It so happened that the authority of the health officer was county-wide, and that he had jurisdiction over all but eight of the contacts. Immediate vaccination of all contacts was secured, and no cases developed. Another example of the practical value of this arrangement is where consolidated schools are concerned. A town and several townships may be concerned in such a school. The control of a contagious disease in a school district is difficult enough at best. It would be hopeless if the health officer had authority

over only a part of the district. The abatement of nuisances, the control of insanitary conditions, the safeguarding of water supplies and of milk supplies can all be handled more satisfactorily on a county-wide, rather than a local basis. In this connection, the practical value of county-wide health administration was effectively demonstrated during the Mississippi flood. In those counties where organized health work existed, the health department immediately acted in the face of this great emergency. Its staff and all of the committees with which it ordinarily worked were instantly available for service. In fact, one of the first and most effective relief camps organized during that whole emergency was put into operation under the leadership of the county health officer.

3. It is economical.

The activities of the average well-rounded health department may be grouped under four heads; executive, clerical, inspection, and public health nursing. If need require and finances permit, these may be further subdivided. They represent, however, the minimum so far as effective organization is concerned, and they require a minimum staff of four trained, whole-time workers. It might be supposed that a staff of this size, with the funds necessary for its activities, would be an expensive luxury. This is not necessarily, and in fact not generally, the case. When one considers the amount of money spent by the average county for its court and law enforcement officers, the expenditures required for a health organization do not appear formidable. In the health department with which the writer is connected, the staff consists of eight whole-time members and one part-time member, namely a health commissioner, assistant health commissioner, sanitary inspector, a clerk, four public health nurses, and a janitor (part-time service). The total cost of this work for 11 months in 1927 was \$18,107.35, a per capita cost of 43 cents, and a levy amounting to a little over two-tenths of a mill on the tax duplicate, if all subsidies are disregarded. Surely, this cannot be considered a burden upon the tax payer. The absolute control of three threatened small-pox outbreaks during the year saved the people of the county enough in doctors bills, funeral expenses, and loss of time to justify the expenditure even if no other work had been accomplished. However, more than 19,000 services were rendered to the community during the first, which was the organization year. A complete sanitary and health survey was made of every incorporated town in the county, and the foundation thereby laid for a constructive health program designed to meet the specific needs disclosed by these surveys.

More than 7,000 school children were inspected, every school building was inspected and the water supplies examined, every crippled child in the county was visited and competent examination and treatment secured for all whose parents were willing to co-operate. Hundreds of children were given mental tests, and measures taken to deal with those who were found sub-normal. 330 prenatal or maternity cases were aided by the nurses, over 1,000 infants were regularly visited, almost 1,000 visits were made on tuberculosis cases or on tuberculosis contacts, sanitarium care was provided for those cases which needed it most, social service was rendered to a considerable number of families who were found to be in need, 787 communicable diseases were dealt with, diphtheria antitoxin was provided free for every case of that disease, over 200 laboratory examinations were made, almost 4,000 inspections were made of dairies, food handling establishments, public and private water supplies, etc. The staff members traveled over 50,000 miles to render these services. The vital statistics of the community were gathered together from various sources and made available for study. At the close of the year, milk regulation was put into effect in the one city of the county, which has already had the effect of giving the city the safest and best milk supply it has ever had in all its history, without resulting in an increase in the price of the milk. Moreover, its reflex influence has resulted in a very marked improvement in the quality of the milk offered for sale in the smaller towns. All of this service, so briefly summarized, and much more that cannot be so briefly discussed, has been accomplished at a cost of approximately three and six-tenths cents per capita per month. This is not an isolated example of the economical way in which health work is conducted. It can be duplicated in hundreds of county health departments over the United States.

The county health administration is economical also in that it makes it possible to employ specially trained and capable members on the staff. It is obvious that adequate salaries attract men of ability. Although the remuneration offered in the various branches of health work is by no means alluring, it is true that high-grade men and women in increasing numbers are entering this field. They will continue to do so in proportion as health organizations are able to offer more adequate compensation. The more able the personnel, the more effective will be the work accomplished. Efficient work is always the most worth while, and consequently the employment of an efficient staff is an economical procedure in the long run.

4. It facilitates the co-ordination of effort by auxiliary agencies.

A final advantage offered by the county as the unit of health administration lies in the increased possibility of co-ordinating the work of private organizations interested in health work. The members of such organizations are naturally keenly interested in their own communities. It has been repeatedly found feasible to effect a happy co-operation between such agencies and the county health organization. Where this is accomplished, it prevents duplication of effort, saves overhead expense, and thus ensures the use of a greater proportion of the funds for the purposes for which they were contributed. This tends to increase the satisfaction of the members in the service in which they are especially interested.

There are certain disadvantages connected with the county as the unit of health administration. One of the most outstanding, is that offered by politics. In some communities this affects the appointment of every employee on the staff, from the health officer to the janitor. In a certain county the health officer (who is a Republican) is endeavoring to fill a vacancy on his nursing staff. The health officer insists that she be a good nurse and the politicians insist upon the additional qualification that she be a good Democrat. Until communities can be brought to realize that matters pertaining to health are above politics, health work must inevitably be carried on under a serious handicap. Happily, in many counties the health work is coming to be regarded as of paramount interest, and health staffs are being chosen more and more on the basis of ability. However, the influence of politics is not confined to the appointment of the staff. In the carrying out of the required activities, many a health officer is hampered by local political pressure. Let any health officer try to introduce into a community a milk regulation, or a meat inspection ordinance, or a measure to ensure sewer connections, or any other measure which involves a considerable number of people financially interested, and he will know the power of political influence. If his board of health is composed of citizens of high ideals and moral stamina, who will give him the fullest support, he will be able to carry through very difficult projects. Otherwise, his path is beset with difficulties. In a community so small as a county, there appears to be no escape from these "rebuffs that turn life's smoothness rough." They must be accepted as part of the game.

A second disadvantage lies in the fact that a county is too small a base for operations in handling certain important health matters,

such as stream pollution, pure water supplies and pure milk supplies. Streams usually pursue their meandering course over several counties, and pollution in one county may seriously endanger another county. If adequate regulations to ensure a pure milk supply are passed and enforced in one county alone, many farmers will sell their product into adjacent counties in order to avoid compliance. As the farmers tend to trade where they sell their products, this is likely to a certain extent to disrupt established lines of trade and to bring strenuous objections from the merchants of all small towns affected thereby.

This leads to a third objection, namely, the lack of uniformity in health administration which the county organizations tend to. This is a very real disadvantage as every health officer knows. However, this lack of uniformity is not limited to the county as a unit of operations. It exists under the purely local system to a much more marked degree, and it exists even when state organizations are concerned. One has but to study the regulations regarding the handling of communicable disease in the various states to see the chaos which now is so wide-spread in this respect. As an example, it so happened that scarlet fever occurred in two houses on opposite sides of the same street in a town. One side of the street was in Ohio and the other side in Indiana. The house on the Ohio side was placarded for a period of 30 days, whereas the house on the Indiana side was placarded only 21 days. An explanation can be offered but what justification for this divergence can be given to the people quarantined? In various other respects the states differ in their health regulations, and there is very much needed an interstate agreement as to such procedure. The confusion within a state with regard to the degree of enforcement or non-enforcement of laws, or with regard to the activities maintained is considerable. The remedy for this situation would appear to be the exercise of a greater measure of advisory control on the part of state departments of health in regard to the training of the staff of the county or city health departments, and in regard to the general program of activities conducted by them.

A fourth disadvantage is the existence in many localities of inter-town rivalry. The health department must of necessity be located in one town which, ordinarily, should be the county seat. If in times past several towns in the county have competed for the honor of being the seat of county government, the animosities engendered by the struggle may last for years to interfere with any and all activities emanating from the successful

town. A health department working in a county torn by such factional spirit will have this obstacle to overcome. Upon the success with which it is overcome will depend the success of the health work, for the very foundation of health work is the ability of communities to work together for the common good.

A fifth disadvantage in some counties is that the centering of activities in one town may make the department too far removed from distant communities. This disadvantage in many instances is more apparent than real, however. None in the county visit so many homes as do the health officer and his staff. None know quite as well as the staff how people really live. Through the home visits by the nurses, the inspections by the sanitary inspector, the investigations conducted by the health officer, and the information gained by the detailed surveys of the various districts, the health department probably has more intimate knowledge as to the sanitary conditions, the mental rating of the children, the general standards of living, the morals of supposedly respectable people, etc. than most of the people living in the communities themselves. As to the inaccessibility of the health department, it all depends upon the energy of the staff and the state of the roads. In well-developed counties, it would probably require less trouble for a resident of a distant farm house to call the health officer and make known his needs than to try to secure the assistance of his neighbors. As an example, the writer was in a county health office one bitterly cold day last winter when the telephone rang and a man notified the health officer that a family in a remote section of the county was absolutely without coal. Although this was a social service rather than a health service, the health officer took immediate action. Within an hour he had located the township trustees, and a load of coal was on its way to the distressed family. In counties where roads and telephones are non-existent, the disadvantages of centralization are very definite, and some solution remains to be found.

In conclusion, it should be pointed out that in a country so large and with such varied problems as this, it would be folly to advocate any one type of organization as being universally applicable. There are counties so large in some states that no one department which the county could support would be able to render a really adequate service. There are counties so poor that the raising of even \$1,000 a year for the purpose would be a burden. There are counties so lacking in roads and other means of communication that the isolation of the various settlements is practically complete. There are counties

where the communications are so excellent that the entire county is practically a single settlement. Obviously, the health organization must be developed with local conditions in mind. Wherever, however, the local conditions at all permit, the advantage of county organization appears to out-weigh the disadvantages, and as backward communities become more progressive it is probably that this unit of organization will be more and more adopted.

SUMMARY

The advantages of the county as the unit of health administration may be summarized as follows:

1. It affords a logical base for operations.
2. It is practical.
3. It is economical.
4. It facilitates the co-ordination of effort by auxiliary organizations.

The disadvantages inherent in such an organization are:

1. It is too subject to political influence.
2. It affords too small a base for handling certain important health problems.
3. Without close state supervision, it tends to lack of reasonable uniformity in dealing with health problems.
4. It is subject to the effects of inter-town rivalry.
5. In some parts of the country, the centering of the activities may make the department inaccessible to communities needing its service.

Mesenteric Lymphadenitis.—McFadden asserts that mesenteric lymphadenitis is of frequent occurrence in children. The most common period for the complaint is between 7 and 11 years of age. Symptoms date back over a long period. The history of frequent attacks of lassitude, drowsiness, headaches and loss of appetite for weeks past is very common in these patients. Attacks simulating acute appendicitis, duodenal ulcer and other abdominal diseases are common. The site of tenderness in inflammation of the ileocecal group of glands is not McBurney's point but a situation higher up and more medial than this point. The cause of the condition is probably infection by the bovine tubercle bacillus, with a superimposed condition such as acidosis causing an acute attack. Acute conditions of the abdomen in children that are due to acidosis are caused by an underlying mesenteric lymphadenitis.

CARE OF TUBERCULOSIS*

By PAUL A. TURNER, Louisville. Director of the Bureau of Tuberculosis, Superintendent of State Tuberculosis Sanatorium.

I have been asked to talk to you about tuberculosis with special reference to the care of the tuberculous individual during the winter time. A strange subject, some may think, to speak about over the radio. But, is it? Wherever there is a radio in Kentucky there is some one who either is ill with tuberculosis or whose relative or acquaintance has it, or some one who has the disease and doesn't know it, or some one who may have tuberculosis at some future date.

At the most conservative estimate, there are at present at least 20,000 persons suffering from tuberculosis in Kentucky.

Naturally sanatoria patients are listening in and to them what I shall say is an old story particularly to my own patients at Hazelwood, the State Sanatorium.

It is then to those patients who are confined at home that I am especially speaking as well as to every Kentuckian who must have the welfare of those persons at heart and who, of course, desires to prevent the spread of this disease throughout our Commonwealth.

First Prevention. Fortunately, the white race has acquired considerable immunity against tuberculosis so that to take the disease one must be exposed rather constantly to the infection or else be much below par while harboring tubercle bacilli in the body. In other words, a person who keeps himself in the best of physical condition wears the best armour with which to withstand the onslaught of tubercle bacilli. To maintain this sort of physical condition, one must take sufficient time from work to play. He must eat regularly, sleep sufficiently, and exercise daily. Added to this, an examination once a year by his physician is necessary.

On the other hand, lowered bodily resistance invites tuberculosis. Fatigue from overwork, dissipation, the loss of sleep—one of our most besetting sins at present—debilitating disease and so forth, cause this lowered resistance.

Influenza is the forerunner of many a case of tuberculosis and as a result of the present unfortunate epidemic, our death rate from tuberculosis will undoubtedly be increased.

Those of you that are listening, who have had the "flu," should have your lungs examined at once by a competent physician to determine the presence or absence of active tuberculosis. If this is done many a case of tuberculosis following the flu will be discovered

*Radio Talk over WHAS Louisville, February 17, 1929.

early enough so that the patient may thoroughly recover. I hate to think of the cases that might be cured, neglected now, and in a year or so will be brought to the sanatorium on a stretcher.

Now then as to the tubercle bacillus itself, the organism which actually causes the disease:—If all these bacilli could be destroyed before they enter the body there, of course, would be no tuberculosis. In sanatoria we do this by burning all sputa and it is a well known fact that it is very rare for an attendant in a tuberculosis sanatorium to become infected with the disease.

This same precaution should be carried out where a patient is in the home in order to prevent the spread of the disease to other members of the family. Unfortunately the rigid care necessary is often not given, with the result that others catch the disease.

So then, to prevent tuberculosis, live right and destroy the tubercle bacillus. Sounds simple but neither one is done. Only 2% of people do the first and tuberculous patients outside of Sanatoria are notoriously careless in doing the second.

To control tuberculosis, then, education is of prime importance and all forces employed to fight this disease do their utmost to educate. The Sanatorium, for example, not only is an institution for the care of the sick patient, but is first of all, an educational institution teaching how a patient may get well and how cases should be handled to prevent the spread of the disease.

To adequately meet the situation, as far as sanatoria are concerned, it has been determined that in connection with all other combative measures there should be the same number of sanatoria beds as there are yearly deaths from tuberculosis in any given area.

In Kentucky during the last three years an average of 3000 persons have died from tuberculosis. This means that in this State there should be 3000 sanatoria beds.

The combined number of beds available for tuberculosis cases in Kentucky is less than 700. At least 2000 additional beds are absolutely necessary to adequately meet the demand.

Jefferson County, with Waverly Hills Sanatorium, and Fayette County, with the Julius Marks Sanatorium, are the only counties in the State which have the necessary number of beds for their communities. Hazelwood, your State Sanatorium with its meager capacity, is of course wholly inadequate for the rest of the State. Hazelwood has a bed capacity of 75 with only twelve of these that are free beds, paid for by the State. We have in our files over 2000 applications for these twelve beds, some of the most pitiable letters

imaginable. Naturally most of these patients will die and also infect many other persons for the want of adequate care and education.

The last Legislature appropriated \$200,000 to start a building program and to provide additional free beds at Hazelwood, your State Sanatorium, but this was vetoed by the Governor.

At the next Legislature we will try again. Meanwhile the project may be hastened to meet the emergency by a drive for funds put on by private agencies.

Now as to the treatment of the actual case of tuberculosis: The care during the winter months differs in no essential manner from the care at any other time of the year. It is true, however, that old people do not stand extreme cold very well so they do better with their beds indoors where fresh air may be warmed. Young people, on the other hand, seem to progress very favorably with their beds on porches no matter how low the temperature. They are kept warm, of course, by warm light covers, sleeping bags, caps, mittens, and heating devices.

Absolute rest in bed is of the first importance in treating the active case of tuberculosis. Without this rest a patient rarely recovers.

It is difficult for many people to submit to this rest treatment and it is first necessary for such a patient to make up his mind to make a business of getting well and to let no worry or ambition interfere with the regime. Rest of mind as well as of body is essential.

Rest in bed should usually continue till the patient's temperature and pulse rate have remained normal for a period of two months when a slight amount of exercise may be tried in graded doses. When this time comes it is usually a danger time for the patient. He feels well and thinks he can do safely many things that he shouldn't. It is the time when sanatoria patients want to go home. So often has a patient gone home, done too much, and has had to return to the sanatorium and spend more months in bed because of his eagerness to do things. At this stage, then, the patient should be under the close observation of his physician and be told the things that he may and may not do.

Fresh air is the next essential for the patient. A tent house or a small cabin, either one with all sides open and properly screened and curtained or a porch resembling a sanatorium porch, is preferred for the patient. If this cannot be procured, then a room should be selected with as many windows as possible and these windows should be kept open and arranged, if possible, so that there may be no dead air spaces in the room. So often a patient lies in bed in a room with all the windows closed. Don't let this occur.

Of equal importance is good food. Three meals a day at regular intervals and, if a patient wants it, a glass of milk between meals. A full rounded diet should be taken if possible. Some patients are deluded with the idea that eggs and milk are essential to the cure of tuberculosis. They are not, and where taken to excess or without other articles of diet, the stomach rebels and the patient is made worse. Eggs and milk, however, should be used in the diet but used judiciously not forgetting other necessary foods. The stomach should never be overloaded and forced feeding should never be tried. The digestive tract should be kept in the best condition possible for there is where the fuel must be created into the energy which the body utilizes in helping to overcome the infection.

Climate is not essential in the treatment of tuberculosis. A search for climate is usually a waste of time and money. One may recover from tuberculosis in Kentucky just as well as in health resorts, provided he has the proper care.

Rest, fresh air, and good food are the essentials and chief of these is rest.

At sanatoria we utilize certain aids in treatment, such as the ultra-violet ray which helps certain conditions. The artificial pneumothorax treatment gives results sometimes which appear miraculous but unfortunately only about five out of every hundred cases are suitable for this treatment.

There is, of course, no medicinal cure and medicines are of value only to relieve certain symptoms. The less medicine given, the better off is the patient.

Now then, as tuberculosis causes more deaths than any other disease in Kentucky, it means that all our people should lend their aid whenever and wherever possible to combat the spread of this malady and help those that have the disease to return to normal health.

Any of you who are listening may have tuberculosis sometime. Let's prepare for the future and provide all that is necessary to reduce our terrible death rate from tuberculosis and provide the means to care for those who might return to active work in their communities if they had the chance to be cured.

Recording Muscle Tests.—Lowman uses a scale composed of nine gradations, estimating muscle movement, effect on gravity as evidenced by joint movement, and muscle action against both gravity and resistance load.

SUB-TOTAL GASTRECTOMY FOR THE RADICAL CURE OF GASTRIC AND DUODENAL ULCERS*

By JOSEPH M. FREHLING, M. D., Louisville.

The treatment of gastric and duodenal ulcers, both from the medical and from the surgical point of view, is a subject of such vast magnitude, that it would be absolutely futile to attempt even a cursory presentation of all its various phases. Not only do physicians differ widely as to the proper medical treatment of gastric and duodenal ulcers, but surgeons also have failed to agree upon the best surgical procedure. There is a growing tendency among surgeons to agree that gastric ulcers should be removed by excision with or without an added gastro-enterostomy, by sleeve resection, or by partial gastrectomy; where as the majority of surgeons still insist that gastro-enterostomy is the preferred method of operative treatment of duodenal ulcers.

The impetus for a more radical procedure in the surgical treatment, not only of gastric but also of duodenal ulcers, came from Europe. Haberer, in 1920, reported 80 cases of gastric, duodenal and gastrojejunal ulcers, all treated by partial or sub-total gastrectomy. He has since reported 929 cases. Besides other large series published recently. Eieselberg reports 691 cases, Friedman 598, and Finsterer 503 cases.

It may be of interest to present before this society the experience of the gastro-enterological surgical service of Mount Sinai Hospital, a group service organized 14 years ago. In the early years of this period, gastric ulcers were treated by excision, with or without gastro-enterostomy, or by sleeve resection. The end-results obtained by these more conservative operations were so bad that partial or sub-total gastrectomy was soon adopted as the method of choice in the treatment of gastric ulcers. Patients thus treated have shown the most excellent results, the observation time in some cases being 12 years. They are perfectly strong and healthy without any gastric complaints.

The experience at Mount Sinai, during the same period, with the duodenal ulcers in which gastro-enterostomy with or without pyloric exclusion was the method of choice, led to the impression that the results here, too, were not satisfactory. A large number of patients returned to the follow-up clinic complaining of the same or even worse symptoms than those which had brought them to the surgical service originally.

A careful survey of gastro-enterostomies

*Read before the Jefferson County Medical Society.

performed on this service between 1915 and 1920, for pyloric and duodenal ulcer, showed that only 50% of the patients were cured, and that 34% suffered from the most serious complication of gastro-enterostomy, namely, gastro-jejunal ulcer. In 18% of these cases gastro-jejunal ulcers were proved to be present by re-operation. In another 16% the clinical and roentgen-ray findings were those of gastro-jejunal ulcer. It does not seem fair to include in statistics on gastro-jejunal ulcer only those cases which come to re-operation, as has been the custom of different authors on this subject. A statistical study based on those cases alone, gives a distorted impression on the frequency of gastro-jejunal ulcers.

The frequency of this complication and the persistence of duodenal ulcers following gastro-enterostomy, led to the abandonment of gastro-enterostomy and its replacement by partial or sub-total gastrectomy in practically every case. This new policy was instituted on November 1st, 1922, and has been followed consistently ever since. Although the observation time may not be long enough for definite figures as to end results, we are prepared to state that the percentage of cures has been raised from 50% to about 90%, by substituting partial or sub-total gastrectomy for gastro-enterostomy in the surgical treatment of duodenal ulcers, and while before gastrojejunal ulcers were observed in 34% of the cases, not a single one has been observed following partial or sub-total gastrectomy.

It seems, undoubtedly, a rather formidable procedure to move 1-2 or 2-3 of the stomach in the presence of a gastric or duodenal ulcer, which is often not more than 1-2 cm. in diameter. However, experience has shown that the mode of procedure should not be selected according to the size of the ulcer. Ulcers, large or small, should be subjected to the same operative method, that is, partial or sub-total gastrectomy.

The reason for the excellent results following partial or sub-total gastrectomy, seems to lie in the fact that an immediate and permanent achlorhydria is established in the majority of cases. Lorenz and Schur, in 1922, showed that hyperacidity is changed into achlorhydria in a very large percentage of gastric resections.

Both physicians and surgeons agree that our therapeutic measures in the treatment of gastric and duodenal ulcers should be directed toward a marked reduction of the hyperacidity. There is no doubt that by medical treatment gastric hyperacidity may be reduced temporarily. However, no medical procedure can establish permanent achlorhydria. As soon as the treatment is stopped, previous

acid values are re-established.

The curative effect of gastro-enterostomy on pyloric and duodenal ulcers is usually ascribed to three substantial changes in the mechanics and chemistry of the stomach brought about by this operation: (1) the side-tracking of the food; (2) a marked reduction in the hyperacid stomach juice by the regurgitation of bile through the gastro-enterostomy stoma; and (3) the relief of pylorospasm with subsequent healing of the ulcer. It is generally assumed that these three factors play a very important role in the healing of pyloric and duodenal ulcers. In fact, in most of the surgical text books, published during the last 30 years, these three points are mentioned as the causes for cure of ulcers following gastroenterostomy. Students are given the impression that these are not theories, but facts, and that the value of gastroenterostomy as a side-tracking and acid-reducing operation has been established without a doubt.

The medical and the surgical profession have also accepted the correctness of these statements. Careful investigations, however, by different authors, have thrown serious doubt on the supposition that gastroenterostomy side-tracks the food, and thus favors healing of the ulcer, by putting the pylorus and the duodenum at rest.

Kelling established two intestinal fistulae on gastroenterostomized dogs, one in the jejunum distal to the gastroenterostomy, and one in the duodenum. Most of the methylene blue solution given to dogs came out through the duodenal fistula; less than 10% passed through the gastroenterostomy.

Cannon, who studied the function of the gastroenterostomy with the aid of roentgenography, came to the following conclusions: "The idea that gastroenterostomy represents a drainage operation is wrong. There can be no doubt that in animal experiments the natural exit of food is through the pylorus, and not through the artificial opening, when both ways are offered for the passage of the food."

Lewisohn demonstrated that after feeding theonin-blue to gastroenterostomized dogs, the stomach, the duodenum, and the jejunum, below the stoma, show the same dark blue color. In other words, he demonstrated that, in spite of the gastroenterostomy, a large part of the fluid passed through the pylorus and duodenum. When pyloric exclusion, according to Berg's method, was added to the gastro-enterostomy, only a slight trace of the theonin-blue was found in the duodenum, whereas the jejunum showed the same dark greenish blue color as in the first series of experiments.

Many other authors have made similar observations, which tend to show that in the

presence of an open pylorus, most of the food passes through the duodenum in spite of the presence of gastroenterostomy.

If we begin to peruse the literature on the second point, i. e. the reduction of hyperacidity following gastroenterostomy, we find practically uniform agreement among the authors that regurgitation of bile through the newly established stoma reduces the hyperacid gastric juice to a very marked degree. Innumerable papers have been written on this subject. They are practically in accord that gastroenterostomy causes either a complete anacidity or a marked reduction of the acid figures. However, a few dissenting voices have been heard during the last few years.

Conybears states that following a gastroenterostomy, most of the duodenal ulcer cases have a high acid figure.

Wydler, who examined gastroenterostomized patients one to seven years after operation, found a marked reduction of the acid value immediately after operation. However, these reductions were not in evidence when he examined the patients a number of years after the operation.

Lewisohn, in a recent paper, made a comparative study of the acid values reported on the re-examination by the Ewald test meal of patients operated upon for gastric and duodenal ulcers. This study was made from a review of 69 cases, in which gastroenterostomy, with or without excision of the ulcer, was performed, and 85 cases following resection. The difference in the reduction of acid values was most striking.

A perusal of these test meal figures shows that 64 in the group of 85 patients had achlorhydria upon their dismissal from the hospital, or when they were re-examined in 1926, a percentage of 75%. Eight cases showed low figures for free hydrochloric acid, that is figures below 10. Thus 84% had either complete achlorhydria, or free hydrochloride in a very small quantity. On the other hand, in the group of 69 cases in which gastroenterostomy was performed, achlorhydria was found in only 2 cases, and in only 3 other cases was the free hydrochloride below 10. Thus 3% following gastroenterostomy showed achlorhydria, and 7% figures below 10; 75% and 84% as compared with 3% and 7%.

As is very often the case in the progress of medicine, practical experience led the way, and the scientific explanation followed subsequently. Haberer had already performed sub-total gastrectomies in duodenal ulcers for a number of years when Lorenz and Shur pointed out the importance of achlorhydria for the permanent cure of ulcers of the stomach and the duodenum.

The explanation for this marked reduction

in the figures for free hydrochloric acid following resection of the stomach is not quite clear. It is well known that the acid producing glands are situated in the fundus and body of the stomach. It is assumed that a hormone is produced in the antrum which activates the acid glands. In other words, the motor power for the acid producing glands is in the antrum. This seems to explain the marked reduction in acid figures following partial or sub-total gastrectomy.

We are well aware of the fact that complete absence of free hydrochloric acid in the gastric contents is generally not considered with favor by the internists. However, it is beyond doubt that achlorhydria following partial or sub-total gastrectomy does not interfere in the least with the well being of the patients.

We have never seen pernicious anemia develop as a sequel to partial or sub-total gastrectomy. We have never seen a gastrojejunal ulcer develop in a patient who had complete absence of free hydrochloric acid.

Another problem, aside from the chemical question of post-operative achlorhydria, is involved in the radical surgical treatment of gastric and duodenal ulcers. Konjetzny and Kalina have shown that in ulcer cases the distal half of the stomach shows a chronic gastritis, which is a predisposing factor for ulcer formation. Gastroenterostomy does not remove this area and ulcers can form, and will form in the stomach or duodenum, and at the new stoma, in spite of the presence of a gastroenterostomy. Partial or sub-total gastrectomy removes the whole inflammatory area, and thus prevents further trouble.

It is our firm belief that the enthusiasm for gastroenterostomy will wane during the next few years, and that in 10 years from now, gastroenterostomy will be used for the treatment of pyloric and duodenal ulcers as a make-shift operation, not as the method of choice. The clinical results following the more radical procedures are so infinitely superior in every respect, that the surgical profession will gradually adopt this method as the only procedure which seems to guarantee a permanent cure to a patient suffering from gastric or duodenal ulcer.

DISCUSSION

Irvin Abell: I wish to thank Dr. Frehling for giving us the views which obtain in the Mount Sinai Clinic concerning the treatment of gastric and duodenal ulcers. I have had the pleasure of visiting that clinic and watching the work of Dr. Berg. While I have been deeply impressed by their results, I am not yet ready to accept in full all the propositions for treatment mentioned in the paper. So far as I know Mount Sinai Clinic is one of the very few in this country that

has completely accepted the views enunciated by Finsterer. I was impressed by the 'thoroughness in the work-up of their cases, as well as that shown in following the after-history of the patients. It was interesting to note that the acidity of the stomach was not reduced to zero by pyloric and prepyloric resections and that as a result of this observation they have continued to resect more and more of the stomach until at present practically three-fourths is removed. It has been stated that the stomach is a hopper for mixing and grinding of food and that an individual can get along almost as well without it as with it. Certainly operative removal has now been done in a sufficient number of cases to demonstrate the fact that the functions of the stomach are quite readily assumed by other portions of the digestive tract. Yet it seems to me that resection of three-fourths of the stomach for the cure of a duodenal ulcer is an operation of greater magnitude than the lesion justifies. I am sure all of you will remember the paper presented by Balfour a few years ago in which he discussed the then present condition of one thousand cases of duodenal ulcer treated by gastro-enterostomy at the Mayo Clinic ten years before the compilation of the paper and in which he reported ninety per cent of symptomatic cures. Since gastro-enterostomy can be done with an operative risk of one and one-half per cent, and since we may expect ninety per cent of cures, it seems to me to be the preferable procedure.

My preference in the treatment of duodenal ulcers has been cautery destruction of the ulcer combined with gastro-enterostomy. We have tried excision of the ulcer alone, destruction of the ulcer with the cautery alone, pyloroplasty, and gastro-enterostomy alone, and have finally reached the preference just mentioned. We have had subsequent gastro-jejunal ulcers and have had recurrence of the ulcer near the pylorus in some instances finding it necessary to reopen the abdomen and resect the pylorus before cure has been obtained. In those instances in which we have had to do this as a secondary operation, so far as known, there have been two bad results. In one, jejunal ulcer followed and the patient died later from massive hemorrhage; in the other, ulceration recurred at the junction of the jejunum and stomach with the development of a fistulous communication with the colon.

I think that our experience in gastric ulcer has led most of us to the same conclusion, namely, that when near the pylorus a pyloric resection is advisable, that when high on the lesser curvature or posterior wall, resection of the ulcer with or without gastro-enterostomy is indicated.

L. Wallace Frank: I want to thank Dr. Frehling for his excellent paper. I must say, however, that my views are in practical accord with

those expressed by Dr. Abell in regard to the surgical treatment of gastric and duodenal ulcers. So far as gastric ulcer is concerned, I believe complete eradication should be practiced. We know these ulcers have a tendency to undergo malignancy therefore, the ulcer should be removed. In most cases of gastric ulcer resection of the stomach will probably give better results. If such is contraindicated, then the ulcer should be excised or destroyed with the cautery after the method of Balfour.

So far as duodenal ulcers are concerned, I think the operation of resection of sub-total gastrectomy is a rather formidable procedure in the treatment of a lesion which we know is almost certainly benign. While malignancy does occur in the duodenum, it does not develop in the first portion of the duodenum, it occurs at the ampulla of Vater. In duodenal ulcer we have a lesion which, while fraught with many serious consequences to the patient, that of malignant degeneration is not one of them. Sub-total gastrectomy in the treatment of duodenal ulcer is to my mind a more formidable procedure than is warranted and excision with or without gastro-enterostomy or gastro-enterostomy alone is the method of choice in their treatment. After all is said and done, there is no more certainty that we will not have marginal or jejunal ulcers after resection of the stomach than there is after gastro-enterostomy.

At the last meeting of the American Surgical Association there was reported a series of eight or ten cases of ulcer treated by resection and the Polya procedure in which ulcers occurred on the margins and in the ascending and descending loops. While I am uncertain about some of the details of this report, yet it emphasizes the fact that marginal and jejunal ulcers may occur after resection of the stomach, and since this is true it seems that we should reserve this radical operation for lesions on the gastric side where malignancy may occur as a later development of ulcer. In the treatment of duodenal ulcer I think we should accept and practice the more conservative method. Once resection of the stomach is performed, if we have marginal or jejunal ulcer the gravity of the case is greatly enhanced. If we have jejunal ulcer after gastro-enterostomy, the anastomosis may be cut off and the ulcer excised and if the ulcer should later recur, resection of the stomach may be done.

John R. Wathen: I was very much interested in Dr. Frehling's paper. The treatment of gastric and duodenal ulcers is one of the most important subjects before the medical profession today, and it is far from being solved. I must say, however, that the tendency at present is toward more radical measures.

It may be interesting to state that the late William L. Rodman, a former Louisville surgeon was the first in the world to advocate resection

of the pyloric end of the stomach for the cure of gastric ulcer. His views were considered entirely too radical at that time and were not accepted, but today I think we are leaning more and more in that direction. In Haberer's clinic in Vienna, and in other large European clinics, where radical resection is performed for gastric and duodenal ulcers, they have better results with lower mortality than we have in this country. So far as concerns the essayist's statement that no cases are on record where jejunal ulcers have occurred after radical resection of the stomach, I would say that most all the clinics of the country have found, and this has been confirmed in our own experience, that jejunal ulcers do occur after partial resection of the stomach, but fortunately such cases are infrequent.

In regard to the experimental work on dogs (gastro-enterostomy) mentioned by Dr. Frehling: This must not be taken too seriously, because the dog has no ulcer and therefore, in a healthy stomach, he simply makes the mistake of attempting to interfere with normal physiological conditions. It has been proven clinically many times that where gastro-enterostomy has been performed in the absence of pyloric obstruction the result was complete failure. In the dog with no ulcer and consequently no pyloric obstruction, it is certain to be a failure. I have often "unhooked" the stomach where there was no evidence that could be found of ulcer, and yet gastro-enterostomy had been performed. In such cases there was nothing abnormal and under proper treatment the patient would have recovered better without the gastro-enterostomy.

While it may be true that we have performed too many gastro-enterostomies, yet we must not forget the statistics of the Mayo Clinic. They have firmly established the fact that in cases of pyloric obstruction from duodenal ulcer gastro-enterostomy gives 90 per cent of cures. That is a very high percentage of cures and their mortality is low. This fact speaks well for gastro-enterostomy in duodenal ulcers. Considering the fact that duodenal ulcer seldom undergoes malignant change, why should we resect the stomach? We cannot say the same, however, for gastric ulcers. I disagree with the previous speaker that resection of gastric ulcer should be performed without gastro-enterostomy. I have never been able to resect an ulcer on the lesser curvature of the stomach with any degree of satisfaction. I have never been successful with any type of resection except partial gastrectomy. Partial resection is quickly and easily performed and leaves the stomach in normal condition. Work in the Mayo Clinic on the question of gastric peristalsis has shown that the peristaltic waves begin in the lesser curvature, and for that reason we should never resect an ulcer in that location, it is better to completely remove that section of the stomach.

In regard to hyperacidity: It has been proven positively that partial resection does not relieve the acidity in all cases. The so-called acid bearing area of the stomach has not yet been found. More than two-thirds of the stomach has been resected and yet the acidity remained. There are many features concerning the physiology of the stomach not yet perfectly understood.

I heartily agree with the statement that in duodenal ulcer with pyloric obstruction we should perform gastro-enterostomy. In gastric ulcer which is likely to become malignant I am quite sure the operation advocated by the essayist would be ideal.

As to the question whether malignancy originates in gastric ulcer: I am not willing to accept the Mayo's teaching on this feature. I think it has been proven that most of the cases of malignancy do not come from previous ulcer or a history of long continued indigestion. In my own experience, and I have tried to carefully study every aspect of my cases, I have never yet found a single case where I have made the diagnosis of malignancy in which the patient gave a history of gastric ulcer. I do not mean to say, however, that gastric ulcers have no tendency to become malignant. We do not understand the etiology of gastric malignancy.

George A. Hendon: Gastrectomy has always seemed to me to be such a formidable operation that I admit I have been intimidated by it and have contented myself with doing gastro-enterostomy for duodenal ulcer and excision for gastric ulcer. The chronic aspect of the subject has been well presented and thoroughly covered. However, I would like to present an emergency phase of some importance. We occasionally are confronted with perforating duodenal or gastric ulcers,—more frequently duodenal,—in which the patients have become so weakened and vitality reduced so low from the effect of shock and peritonitis that they are unable to withstand any extensive surgical procedure. I had occasion to deal with such a case about a year ago in which there was sudden rupture of the duodenal ulcer situated just distal to the pylorus. Upon opening the abdomen and exposing the lesion fluid could be seen escaping through the duodenal perforation, and in my efforts to close the opening it was found that the margins were cartilaginous and extended well outward into the duodenal structure thus rendering it quite impossible to make a satisfactory closure. The patient was in such a condition that she could not withstand a resection and I determined to meet the situation by partially inverting the duodenum into the stomach, including, of course, the area containing the ulcer. This procedure was followed, the stomach walls being folded over the leak which effectually closed it by three layers or peritoneum superimposed. We then performed an anterior gastro-enterostomy. Another pro-

cedure was adopted which I have found useful in other abdominal emergencies, viz., catheterization of the appendix, a catheter being introduced eye end first through the lumen of the appendix, the other end of the catheter left protruding from the lower angle of the abdominal wound. By that means not only is drainage secured from the intestinal canal but nourishment and medication can be provided for the patient during a period of five or six days. If the meso-appendix is divided the appendix sloughs away at the end of six days and is thereby removed. I have employed this procedure in sixteen cases in none of which has there been any leakage and the wound has closed promptly without fistula. This procedure was adopted for the purpose of supplying the patient with nourishment during the time the stomach was out of commission.

The patient just mentioned made a satisfactory recovery and has continued to gain in weight. It has now been twelve months since the operation was performed.

Virgil E. Simpson: I have nothing to say regarding the mechanics of surgical procedure except in so far as they may have some bearing on our conception as to the causation of ulcer. Until we know WHY ULCER, surgeons and internists alike are going to be continually groping more or less feeling their way, meeting with disappointments,—and the internists meet with the “big end” of the disappointment. Most of the satisfactory outcomes from surgical procedures are charted when the patient is dismissed from the hospital. Surgeons talk about “follow-up.” etc., but I think perhaps internists could give them some lessons in “follow-up.” Their patients drift back into our offices, we see the flotsdam and jetsam of surgical failure. They do not face the surgeon again, he has done his worst and the patients seek relief elsewhere. This is more true of gastric and duodenal ulcers, which I would like to designate as peptic ulcers, than any other kind of surgery of which we see the results, with the possible exception of surgery of the gall bladder. I am still undecided about the advisability of cholecystectomy in a large percentage of cases.

WHY ULCER? I think this question is of more importance than whether we shall resect alone or resect with gastro-enterostomy, or perform sub-total or partial gastrectomy, the latter terms meaning the same thing. WHY ULCER, it seems to me, is more important than these mechanical questions, because with that settled satisfactory solution of the other will follow.

I have never been convinced that mere cure, and this term is used in the sense of healing, of ulcer number one is a guarantee that you have in any wise affected the underlying condition that prompted the development of ulcer number one. There is something behind this, whether it be infection, whether it be excessive secretion,

whether it be due to a disturbance of normal gradient which contemplates pylorospasm plus hypersecretion of acid with impossibility of regurgitation of the duodenal contents, or whether it be a neuritic thing similar to that which occurs, for example, when we have herpes on the lip, has not been determined. We all know how long it takes herpes to heal, that necrosis takes place and the healing process is slow. When that same sort of thing occurs on the mucosa of the stomach, we can understand how food passing over it produces irritation, how contamination by the food occurs with resulting disturbances of the digestive processes and if necrosis takes place that ulcer has an established existence. Whether one or all these things have to do with the formation of ulcers is of considerable moment when we come to consideration of the question of how we are going to deal with them.

Regarding the physiology of the stomach, the last chapter has not been written; but I think we have advanced to the stage where we cannot quite say, with the surgeon, that the stomach is merely a hopper, that food is simply dumped into it, then passes on with its ferments to the next segment of the gastro-intestinal tube. The stomach has a definite function, just as definite as has the liver, pancreas or small intestine, as regards the digestion of food. It plays its part and whenever that part is interfered with it seems that some other portion of the gastro-intestinal tract must assume the function of the stomach. Whenever there is disturbance of gastric function, whether in the direction of motor activity or of secretion, either hypersecretion, hyposecretion or anacidity, it is well known clinically that symptoms always result, and the patient invariably presents himself to the doctor with digestive disturbances, and when analysis is made with fractional study of the fractional contents, disturbances in either one or the other direction are readily appreciated. So I think we have progressed in our knowledge to the point where we can say that the stomach has a definite function to perform.

There has also been learned considerable about the function of the stomach, and of its neighbor the duodenum, with reference to the maintenance of acidity. Why is it that acid in the stomach does not continue to increase during the process of digestion far beyond physiological requirements? The explanation of that is now well established. In the normal condition, where there is no spasm of the pylorus, the regurgitation of the duodenal contents into the stomach brings about neutralization and maintains the physiological balance of the acid content of the stomach; that is to say, whenever the acid content of the stomach rises above the physiological requirements, regurgitation of the duodenal contents neutralizes the acidity.

After operation many of these patients do have

a return of symptoms. I am not as familiar with the end-results, from the standpoint of the internists, of sub-total gastrectomy, as I am with the end-results of the more commonly followed method of resection of the ulcer and gastro-enterostomy; but I know from my experience that not an inconsiderable number of patients return with repetition of almost exactly or quite the same sort of symptoms that first sent them to the doctor before the operation. The only explanation one can offer for this is that the condition which was present when the ulcer developed in that patient before surgery was undertaken still obtains after surgery was completed, and as a consequence a second lesion results and will continue to do so regardless of repeated surgical interventions so long as that condition obtains.

The plea, therefore, that I would make to both internist and surgeon is to try and recognize that this patient brings to us a condition of disturbance of function that is material, and that the mere institution of surgery with the idea of establishing a cure of ulcer number one does not remove from that patient the condition which originally brings him to us and the likelihood of a development of ulcer number two.

M. J. Henry: Dr. Frehling has reported the results of gastro-enterostomy in the Mt. Sinai Hospital as 50 per cent cures, which of course, would mean 50 per cent failures. There was a very interesting discussion on this subject about two years ago before the College of Physicians. One medical man who worked with Dr. Berg stated in his report that they had 50 per cent failures. In seeking for the cause Alvarez, of the Mayo Clinic suggested that possibly the fact that the majority of the patients belonged to the Jewish race was responsible for the high percentage of failures. He stated that in sixteen consecutive operations in the Mayo Clinic for jejunal ulcer, 15 of the patients were Jews. Dr. Frehling stated to prove his contention that gastro-enterostomy does not adequately drain the stomach, that Kelling had found as much methylene blue solution passed through the duodenum as through the new stoma. We know that the so-called natural water-way is through the duodenum, and in the absence of pathology the major portion of the fluid is certain to go through the pylorus. We know from roentgen-ray and fluoroscopic examinations that a watery suspension of barium nearly all passes along the lesser curvature or the so-called water-way of the stomach. I have had the opportunity of examining more than one patient upon whom gastro-enterostomy had been performed and found that the major portion of the fluid passed through the new opening. I think it is true, however, that a large portion of the contents of the stomach in some cases passes through the pylorus and in that way irritates the site of the

old ulcer. It is well for us to remember in the thousand cases reported by Balfour, all the operations were performed more than ten years prior to the date of his report.

I was rather amused at Dr. Simpson's statement that most of the people upon whom gastro-enterostomy has been performed drift back to the physician. We can certainly sympathize with the physician who handles these cases, because he has a difficult problem on his hands. I am sure Dr. Simpson will recognize the fact that all of these patients who apply to the surgeon for relief represent residues from the physician.

Joseph M. Frehling, (in closing): An objection to subtotal gastrectomy which is voiced frequently and which apparently is a source of pleasure to some of our medical friends is, that the procedure is too formidable. Such is not the case though it might appear so to some who have never attempted it. Those surgeons who have performed the operation do not find it especially difficult. There is no reason to believe that any person who is qualified to do major surgery, and who has had adequate training in this particular field, is not perfectly competent to undertake this procedure.

The tremendous progress that has been made in surgery in other fields may be directly attributed to the opportunities afforded us for detail experimental, clinical and pathological study, and there is no reason for believing that gastric surgery may not progress as rapidly and to the same extent that other surgery has developed.

It is my opinion that one of the chief reasons for the retarded progress of gastric surgery has been the limited amount of fresh material for gross and microscopical pathological study. Where subtotal gastrectomies are done, however, this limitation does not exist, and in this study information is gotten that cannot be obtained in any other way. I had hoped to exhibit a group of lantern slides prepared in New York, but they failed to arrive in time. These slides represent gross and microscopic pictures of pathological lesions of the stomach that we have removed. By showing the slides I could have better illustrated the points made in the paper.

It is admitted that the basic cause of gastric and duodenal ulcer has not yet been definitely determined, and as Dr. Simpson has properly stated, until the etiology is settled, a cure will not be forthcoming. In many cases there were discovered minute palpable duodenal ulcers, and every one showed pathological changes in the gastric mucosa from antrum to fundus. Many of the ulcers were microscopic and did not show on the roentgenogram, and they were not palpable. We could see some of the ulcers of the mucosa, but many of them were microscopic, and in every case the pathology was more extensive than could be seen and felt before the stomach was removed. If I could cause you to under-

stand how extensive the pathology is in these cases, you could better realize that there is no reason for treating duodenal ulcer differently than gastric ulcer. I believe it is now quite generally admitted that in gastric ulcer subtotal gastrectomy is the proper procedure, but in the duodenum which is far away on the other side of the pylorus, the same type of operation should not be applied. This is not literally true as the pathology is practically never confined to the duodenal area, and there are usually many microscopic ulcers of the gastric mucosa. In some of our cases there were as many as four or five ulcers of considerable size which could not be felt at the time of operation although our examinations were careful and painstaking.

Dr. Frank suggests the procedure of gastro-enterostomy first, and then if jejunal ulcer subsequently develops to perform subtotal gastrectomy as a **dernier resort**. It certainly must be realized that when once these patients have been operated upon, the procedure is entirely different, the mortality rate being terrific after secondary operation. Some of our patients came to the clinic after resection of the ulcers and gastro-enterostomy had failed to relieve their symptoms. I recall one patient upon whom both anterior and posterior gastro-enterostomy had been previously performed. Every time the patient is operated upon his chances of recovery after subtotal gastrectomy become less. The mortality rate following secondary operation is so much greater than that from primary operation, that Dr. Berg says in his opinion these figures should always be included in the mortality of gastro-enterostomy, because had previous gastro-enterostomy not been performed upon these patients and had subtotal gastrectomy been undertaken as the primary operation, many of them who died following secondary operation would have been living. The mortality rate is 25 per cent in secondary cases against 3 to 5 per cent in primary cases. In doing gastro-enterostomy you are subjecting the patient to later complications and dangers of more radical procedures, and for that reason I fail to see why subtotal gastrectomy should not be performed as the primary procedure.

Dr. Simpson took exception to the statement that the stomach merely represents a reservoir or food hopper under the assumption that it has important functions. Physiologists teach that the stomach has definite functions in digestion and preparation of food for acceptance by the intestine. However this may be, the fact remains that patients have gotten along perfectly well without it. Our "follow-up" was a real follow-up, our patients returned regularly, they were examined in every detail, and apparently whatever function the stomach has, if any, is assumed by some other part of the intestinal tract. If it is necessary to retain that function, it is

satisfactorily handled by some other part of the body. These patients are able to get along very well with one-third, one-fourth, or whatever portion of the stomach that may be left.

Those who follow the question of sub-total gastrectomy and who believe in the operation are not very many in this city at least. I think Balfour's report has done more toward preventing patients from having subtotal gastrectomy performed than any other one man's work or reports. Someone referred to Balfour's explanation of why gastro-jejunal ulcers were so frequently observed in the Jewish race. It is unquestionably true that the Jewish people do have a large percentage of recurrences, and at one time we thought that was probably the correct explanation of possibly 27 per cent of the recurrences. Dr. Berg's attention was called to this and he was about ready to accept it, because most of the other large clinics had reported a high percentage of recurrences among Jews. The Michael Reese at Chicago reported 25 per cent if I remember correctly. So it was thought Balfour was probably right when he suggested that the primary reason for every recurrence was that the patient belonged to the Jewish race. However, when we were about ready to accept that explanation, Haberer published his report showing 32 per cent of recurrences, and there are no Jews operated upon in Haberer's clinic. That seems to be an excellent refutation of Balfour's explanation, and that the proper explanation has not yet been given.

I want to thank the gentlemen present for their liberal discussion and for the gracious way in which they have received my offering. Although most of the opinions expressed are opposed to those outlined in the paper, I am gratified by the fact that I have been able, to a minor degree at least, to stimulate interest in this important field of surgery, a field that has been and is even yet badly in need of concerted effort and interest.

Use of Radium from Surgical Point of View—

Matti relates his experience with the use of radium, from a surgical viewpoint, in the treatment of malignant tumors of various organs and tissues and of their metastases. Some very outstanding results were seen in carcinoma of the prostate, tongue, rectum, tonsil, prepuce, breast, larynx, stomach, etc.; lymphosarcoma, thyroid tumors, tumors of the mediastinum, etc., and metastases of all of these. The need for close cooperation between physicist and surgeon and the employment of a good technic, especially as regards the application of the radium, is emphasized.

WILLIAM HARVEY* (1578-1657)

By EMMET F. HORINE, M. D., Louisville.

The year 1928 marks the three hundredth anniversary of the publication of William Harvey's work on the circulation of the blood. Because of this it would seem particularly appropriate this evening to briefly review Harvey's life and to discuss the significance of his discovery. In doing so we cannot hope to add anything new but we may at least pay tribute to his memory.

The Harvey ancestry is quite obscure and in fact nothing is known prior to Thomas, the father of William. Thomas Harvey was an alderman of Folkestone, Kent, England. His first wife, Juliana Jenkins, died in 1576 and he soon married Joan Hawke. The first child of this second marriage was William Harvey, who was born at Folkestone, on April 1st, 1578.

William probably attended the local school but when ten years of age, he entered the Canterbury Grammar School. When sixteen, he matriculated at Caius College, Cambridge, and was graduated with an A. B. in 1597. We find next that he went to the continent, traveling slowly through France and Germany, seeking medical knowledge. Finally he arrived at Padua, Italy, being desirous of becoming the pupil of Fabricius, who was the successor of Vesalius. It is said of Fabricius that he "was at once a surgeon, an anatomist and the historian of medicine; and as he was the most learned so he was one of the most honored teachers of his day." Such a teacher could not help but inspire the indefatigable worker, the ambitious Harvey. At the time of Harvey's pupilage at Padua, Fabricius was making a careful study of the valves of the veins. Fabricius taught that they prevented over-distension when the blood passed from the larger into the smaller veins and that such valves were not required in the arteries because the blood was always in a state of ebb and flow. Such errors as these must have been first accepted by Harvey but later rejected when he was able to point out the real use of the valves of the veins and show their importance as an anatomical proof of the circulation of the blood.

Harvey was graduated with honors as Doctor of Medicine, at Padua on April 25th, 1602. His diploma states that "he had conducted himself so wonderfully well in the examination, and had shown such skill, memory, and learning that he had far surpassed even the great hopes which his examiners had formed of him. They decided therefore that he was skillful, expert, and most efficiently qualified both in arts and

medicine, and to this they put their hands, unanimously, willingly, with complete agreement, and unhesitatingly." Returning at once to England, Harvey entered Cambridge and was graduated as Doctor of Medicine for a second time within the same year.

Beginning the practice of his profession in London, Harvey was soon extremely busy dividing his time between his patients and his anatomical work. He was particularly interested in comparative anatomy and had dissected over sixty different kinds of animals.

As was customary, he became a Candidate of the College of Physicians in 1604, being elected a Fellow in 1607. He shortly applied for service as physician to St. Bartholomew's Hospital. A peculiar custom of the hospital was to elect a physician to the position held by another, such election to become effective upon the incumbent's death. Actually the newly elected physician was an assistant, being called upon to fulfill the duties of the office during the absence or illness of the actual holder. In 1608, he was appointed to the place of Doctor Wilkenson, who died in 1609 and thus in a year after his election, Harvey was able to assume the full duties of the office. It is interesting to read in the official notification sent Harvey that: "One day in the week at the least through the year or oftener as need shall require you shall come to this hospital and cause the Hospitalier, Matron, or Porter to call before you in the hall of this hospital such and so many of the poor harboured in this hospital as shall need the counsell and advice of the physician."

Harvey must have rapidly gained prominence for in 1615 he was appointed Lumleian lecturer, a position from which forty-one years later he resigned. He began lecturing at once, but it was not until 1616 that he began his anatomical lectures. His notes, which are now in the British Museum, show that this early, he had a true concept of the circulation. He says: "It is plain from the structure of the heart that the blood is passed continuously through the lungs to the aorta as by the two clacks of a water bellows to raise water.

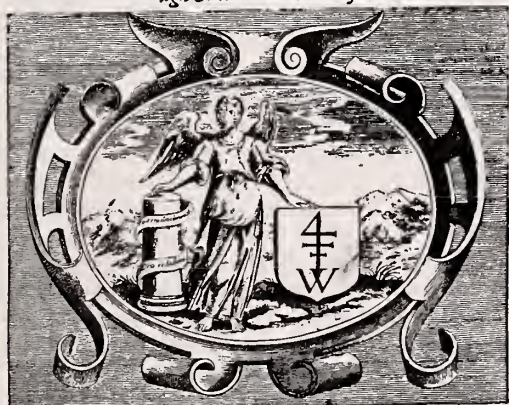
"It is shown by the application of the ligature that the passage of the blood is from the arteries into the veins.

"Whence it follows that the movement of the blood is constantly in a circle, and is brought about by the heat of the heart. It is a question therefore, whether this is for the sake of nourishment or rather for the preservation of the blood and the limbs by the communication of heat, the blood cooled by warming the limbs being in turn warmed by the heart." A delay of twelve years ensued before his epoch making book was issued:

*Read before the Louisville Medico-Chirurgical Society,

"Exercitatio Anatomica de Motu Cardis et Sanguinis in Animalibus." This first edition was published at Frankfort-on-the-Main and consists of seventeen chapters. Harvey at the time was fifty years of age.

**EXERCITATIO
ANATOMICA DE
MOTU CORDIS ET SAN-
GVINIS IN ANIMALI-
BVS,
GVILIELMI HARVEI ANGLI,
Medici Regii, & Professoris Anatomiae in Col-
legio Medicorum Londinensi.**



**FRANCOFVRTI,
Sumptibus GVILIELMI FITZERI.
ANNO M. DC. XXVIII.**

Figure 1. Title Page (reduced) of the first edition of Harvey's classical work.

It is not surprising that much adverse criticism was early directed against such revolutionary ideas. However, slowly but surely his views gained adherents and, what is more fortunate still, he lived to see them generally accepted. Harvey did not reply openly to any of his critics until 1649 when he wrote two anatomical letters to Riolan, of Paris.

Singer has very interestingly called attention to the changes in anatomical nomenclature produced by Harvey's discovery. "In the older physiology the arteries were considered as distributing spirit and a higher form of vital activity, while the veins distributed nourishment and the lowest forms of vital activity. The arteries arose from the heart, and the veins, it was thought, from the liver. The words artery and vein meant something different of old from their meaning today. The two systems, arterial and venous, were recognized to be intimately connected. Both were linked with the heart, though the relation of the arteries was the closer. One branch of the venous system, however, opened into the right cavity of the heart. The vessel, therefore, that arose from that cavity and linked it with the lung, was thus really a branch of the venous system,

and was therefore a "vein." It had thick walls like an artery and was therefore called the arterial vein. It is the vessel we now call the pulmonary artery. A companion to this vessel connected also the left cavity of the heart with the lung. As a derivative of the left side of the heart from which the aorta arose, it was regarded as an "artery." Its walls, however, were thin like a vein, and it was called, therefore the venal artery. It is the vessel we now call the pulmonary vein."

Early in his book Harvey called attention to his method of research by saying: "I profess both to learn and to teach anatomy, not from books but from dissections, not from the positions of philosophers but from the fabric of nature." D'Arcy Power comments on this as follows: "Such a statement is now a mere truism, because every one who starts upon a subject of original research follows the method adopted by Harvey. He learns thoroughly what is known already; he frames a working hypothesis and puts it to the test of experiment. He then combines his, a priori reasoning with a logical deduction from the facts he observes. A feeble mind is sometimes over-mastered by its working hypothesis, and may be led to consider it proved when a better trained observer would dismiss it for a more promising theory. Harvey's hypothesis—tested by experiment, by observation, and by reasoning—was no longer an hypothesis but a proved fact fertile beyond measure, for it rendered possible a coherent and experimental physiology and a new medicine and surgery."

There was one missing link in Harvey's chain of proof namely, he did not show how the smallest arteries were connected with the smallest veins. Malpighi in 1660 supplied this missing link by his discovery of the capillary circulation through microscopical aid. His essay "De Pulmonibus" was issued in 1661. Leeuwenhoek in 1675 confirmed Malpighi's observations and also described the corpuscles of the blood.

While Harvey's fame rests upon a solid foundation by his discovery of the circulation we must not fail to mention his book on generation. Without microscopic aid it would have been too much to expect the production of an enduring work upon embryology. His book did act as a powerful incentive to further study along such lines. Further because of chapters on conception, parturition, the placenta and the umbilical cord containing valuable suggestions it may be said to have been the first work on obstetrics written by an Englishman. In this book too we must pay tribute to the fact that he announced a present accepted and much quoted truth: *Omne animal ex ovo*.



Figure 2. William Harvey, from a painting by Sir Anthony Van Dyck.

Harvey was described as being small in stature, with small dark eyes and rounded face, of olive complexion and raven hair. Apparently he was well liked, had few enemies and did not engage in the acrimonious personal controversies so freely indulged in by his contemporaries. Harvey was married to Elizabeth Browne on November 24, 1604. Their union was childless though she died only a few years prior to him. His later years were spent largely in writing and study.

In 1654 he was unanimously elected President of the Royal College of Physicians, which office he declined modestly, asserting that he was too old and infirm to assume the responsibilities of such a position. He suffered considerably from gout and, in fact, gout was stated to have been the cause of death, but it would seem from the description of his last illness that the real cause was a cerebral hemorrhage. Death occurred on June 3rd, 1657, when he was seventy-nine years of age.

DISCUSSION

J. A. Flexner: I have enjoyed Dr. Horine's paper. The history of great doctors affords an interesting topic for study and discussion. I have always thought there should be a chair of medical history in our medical school. The lives and efforts of such men as Harvey are brilliant examples of industry and might well be a stimulant to other young men as it has been to Dr. Horine in the study of his specialty. Harvey had

more or less difficulty in getting the profession to accept his views regarding the circulation. He labored under the most tremendous influence of Galen and Fabricius. It ought not to be forgotten that the record of the circulation which Harvey wrote is the greater circulation. The lesser circulation was described by Servetus in his volume called "The Trinity" for which book he was so kindly burnt by Calvin.

P. F. Barbour: One of the important things in Harvey's life was that he did not rely very much on history; he "thought things out for himself." He had confidence in his own opinions, he worked constantly and diligently, he waited until he could demonstrate satisfactorily to himself what he believed to be true before trying to convince others of the correctness of his theory. Contrary to what Dr. Horine has said, I think he had a great deal of controversy and opposition, almost as much as Jenner had. In those days it was a strenuous thing for a man to state a new truth and endeavor to maintain his position.

I am somewhat dubious about the advisability of introducing medical history into the already crowded curriculum of our medical schools. I believe it would be better to study medical history among ourselves, and every now and then have someone duplicate Dr. Horine's example, but I doubt the advisability of introducing this into the medical schools, until we reduce the number of hours work required now. By this time of the year, even our better students who are very high-grade men, complain that their minds are so crowded that it is difficult to take in new ideas.

Oscar O. Miller: The seventeenth century may be spoken of as the reform period in medicine. The theories, that had been elaborated in the cloister, were being discarded for observable and authenticated facts. The liver, from time immemorial, was considered the seat of sanguification and it was believed that the veins took their origin from this viscus, and they alone under natural conditions contained the blood. It was imagined that the blood flowed by a flux and reflux through the same vessels. The arteries were supposed to contain vital spirits of which the heart was the reservoir. Galen believed that the arteries contained blood at every period of life, and that the blood poured into the right side of the heart by the great veins, and that it then passed to the left side of the heart through porositities in the ventricular septum. He believed that a small portion of the blood passed to the lungs by way of the pulmonary artery. This belief was uncontested until the middle of the sixteenth century. It was well known at this period that if an artery were tied that it ceased to pulsate below the ligature, whereas if a vein were compressed it became flattened and collapsed above the obstruction and tumefied below. Michael Servetus, the theologian, conjectured that the blood passed from the right side of the

heart through the lungs by the pulmonary artery, and that the blood was returned to the left side by the pulmonary veins. He denied the passage of the blood through the ventricular septum. This thought was later confirmed by Columbus, anatomically, by showing the use of the cardiac valves. A Cesaipin later asserted that the terminal ramifications of the arteries communicated with the veins. This was about the state of knowledge when Harvey attacked the problem.

The essayist is to be congratulated on his excellent presentation.

John R. Wathen: Dr. Horine has given us an interesting paper. Knowing his penchant for ancient historical works, every time I hear of a rare old book I call his attention to it. I think Dr. Flexner's suggestion is one of considerable importance. It seems to me that medical history should be taught in our medical schools. Had it not been for a few men in the historical society of Kentucky, we would have lost a great deal of our history. It seems that certain centuries and certain communities are noted for the wonderful men they produce. Harvey was one of them. His country and his century produced many other notable men.

It has indeed been a pleasure to me to hear someone read a paper entirely different from those usually presented before medical societies. I think it is important to review historical features now and then, as in that way we can appreciate what has been done and be prepared to do better work in the future.

Virgil E. Simpson: While it may be a moot question as to whether any part of the already crowded curriculum in our medical schools should be devoted to the teaching of medical history, there is no question that men who have reached the prime of their activity would find both diversion and instruction in the study of the lives and work of those who laid the foundation of the things we now know, appreciate and use.

While listening to the paper, my mind ran back from Harvey's day over the work which had been done in the anatomy and physiology of the cardio-vascular system in the preceding centuries. In the effort to properly evaluate the work of any man, one must know something of the contributions of knowledge which makes that work possible, and in that retrospect it should be recalled that over 300 years B. C. there was established a medical school in Alexandria, a city with a population of one quarter of a million souls. This school continued its existence for over 400 years. Two of the most distinguished anatomists of that school were Erasistratus and Herophilus. It is the former that I wish, particularly, to consider in connection with Harvey's work.

He was remarkable, even in birth, inasmuch as four different islands claim him as a native. It is not known where he was educated and the first record of his professional activities finds him already established in Syria as Court Physi-

cian to King Micaon, again achieving distinction an achievement, however, which pales to insignificance as one reads the further record that he received \$120,000.00 as his fee for services rendered the king.

He then looked for new and wider fields and selected Alexandria, Egypt. This city had then a population of one quarter of a million and a Medical School already rivalling Athen and Pergamos. This school was founded 331 B. C. and continued a renowned existence as late as the Second Century Anno Domini.

In this school he worked and taught and wrote. Only a few of his works are extant, but from the records of the school and his biographers, particularly Celsus, one learns he wrote treatises on anatomy, on fevers, on hygiene, on drugs and on wounds. His advice covered the range of diet, bathing, abstinence, exercise and friction which probably is the earliest record of massage.

He strongly opposed polypharmacy and preferred enemas to purgatives. He disapproved tapping as well as extraction of teeth if "much force were required." He regarded the liver and spleen as unimportant organs. He invented a catheter shaped somewhat like the letter "S" which is thought to have been the Adam of this rather prolific instrumental family, an added distinctive achievement. He devised the first respiration colorimeter, thus, perhaps, laying the foundation for modern metabolic study—another distinctive achievement. But it was his work as an anatomist which with his financial genius jointly entitles him to a high place in medical history. He went to Alexandria at a period when prejudice against dissection was waning, hence his opportunities for anatomical study were unrivalled. Together with Herophilus, his co-worker, anatomical study by dissection was founded. It is even recorded that they did not always await the arrival of the Angel of Death as a consultant. Celsus records as a fact, both Erasistratus and Herophilus practiced vivisection for which he was bitterly arraigned and thus ambidextrously achieved two distinctions, laying the foundation for a new school of study—Vivisection and the foundation for the Anti-vivisection Society as well. He discovered the lacteals and gave the first correct idea of the trachea and coined its name. He studied the nervous system and distinguished motor and sensory nerves.

His study of the anatomy of the circulatory system is of especial interest to us now. He found and described the structures at the termination of the vena cava and just missed achieving another distinction by discovering the circulation of the blood, for which failure Harvey and all Englishmen should be happy. He described the chordae tendineae of the heart and announced that both arteries and veins arose from the heart. He called the left ventricle the

pneumonic ventricle as he thought it contained no blood. The veins contained blood he thought, but the arteries contained air or pneumonia. Entrance of blood into the arteries from the veins caused disease—never if in large quantities, inflammation if in smaller quantities. He thought that the function of respiration was to fill the arteries with air. He regarded the pulse as of little importance though Hierophilus, his associate, counted the pulse with a water clock and analyzed its rate and rhythm.

One feature concerning Harvey's life mentioned by the essayist was his attitude toward others. I do not believe Dr. Horine intended to create the impression that Harvey did not meet a great deal of opposition. All new ideas expressed by men in those days met with violent opposition, and Harvey was no exception to the general rule. We might group his opponents into two classes: first, those who condemned his ideas, to these he paid no attention; second, those who attempted to disprove his ideas by presenting theories of their own, based on real study and work, with these he patiently proceeded to establish additional facts to prove his own theory about the circulation of the blood which met their arguments and justified the acceptance of his theory.

George A. Hendon: The subject the essayist has introduced is of peculiar interest to me because I have been particularly impressed lately with the value of studying the history of the medical sciences. One feature of interest is the fact that certain periods in history produce more great men than other periods. For example, in the time of Harvey there were four men who moulded the destinies of the medical profession: (1) Harvey, (2) Shakespeare, (3) Sir Christopher Wren, and (4) Robert Boyle. These men were contemporary and every one of them is an outstanding figure today even after the lapse of three hundred years. They were all pre-eminent men who carried the light forward and who foretold the destiny of scientific medicine. Harvey was a man of keen discernment not only concerning the circulation of the blood, but in other things as well. I happened to find a reference to Harvey a few days ago which shows what a keen observer he was.

Another significant feature is the tardiness with which progress was made in that early period. It was one hundred and fourteen years after Harvey discovered the general circulation before they knew anything about the collateral circulation. It was not until the time of John Hunter, or more than one hundred years after Harvey's discovery, that the collateral circulation became known, and it was then discovered by accident. Hunter ligated the carotid artery of a deer and the animal shed his horn on that side and later the horn grew again, the collateral circulation had been established. Just as a matter of interest I might mention that Sir Chris-

topher Wren was the first man who ever attempted intra-vascular medication. That was in 1656.

Another point is that this matter of the circulation of the blood must have been one of public interest at that particular period, because Shakespeare seemed to have had some knowledge of the circulation. Shakespeare died in 1616, and Harvey had probably been working on his theory about that time, because of the words he puts in Brutus' mouth when he said to Portia: "thou art as dear to me as the ruddy drops that visit my sad heart."

As another illustration of great men appearing in centuries, it is interesting to note that it was just one hundred years from Hunter to Pasteur.

John W. Price: I have enjoyed the delightful essay presented by Dr. Horine. Harvey lived in a century of great men and great deeds. Other centuries have also been characterized by the production of great things, and it seems a strange coincidence that these intervals of greatness are often separated by about one hundred years. This brings to my mind the fact that the achievements of the century in which we are living have probably been greater than have occurred since the world began. We are living in the midst of what would have been called miracles a century or two ago. Our great grandfathers would be amazed could they witness the wonderful improvements that have been made in every line of endeavor. They did not have telephones they did not have electric lights generated in their own basements, and hundreds of other conveniences we enjoy today. If men living in the country wanted to study at night they had to depend upon a pine cone attached to the fire for light.

It seems to me that this generation, not only in medicine but other related sciences, has made great progress. Simon Flexner has only recently made a contribution to the science of bacteriology which is going to be talked about three hundred years from now. Alexis Carrel's work on surgery of the blood vessels is another illustration. The vast amount of successful surgery which has been done on the gastrointestinal tract and on the thyroid gland is going to be talked about three hundred years from now just as Harvey's work is today. Such work was not possible a century ago. Those of you who began the study of medicine about the time the germ theory of disease was beginning to take effect, will remember how it was received. That has not been a hundred years ago.

Louis Frank: I wish to thank Dr. Horine for his excellent paper. I agree with Dr. Flexner that it would be a splendid idea to have a chair on medical history in our medical school. By studying the history of medicine we can better appreciate the difficulties encountered by men of former times who had to depend solely upon

the five senses in the diagnosis and treatment of human life. They had no laboratories or other facilities to aid them, their knowledge was gained by observation and experience. As their powers of reasoning developed, they became more successful. It was the foundation laid by these pioneers in the study of human anatomy, that has brought the practice of medicine to the state of perfection it enjoys today.

Harvey encountered many difficulties, and progress was slow. He had to study anatomy from dissections at night, in secret, using the bodies of criminals. He did not have plain-sailing, he was much criticized and opposed by his colleagues, many of whom sought in vain to discredit his discovery.

The study of the history of medicine and its traditions is not only interesting, but valuable, it brings the members of the medical profession closer together, and I want to say again that I think there should be a chair on medical history in every medical school. Papers such as Dr. Horine has presented stimulate us to further study of the great men in medicine of bygone centuries.

Emmet F. Horine, (in closing): In closing I want to express my appreciation of the liberal discussion. Perhaps I did not make myself quite clear in regard to Harvey's distaste for controversy by the broad statement concerning his character. After the announcement of the discovery, there was, of course, considerable opposition. However, Harvey remained silent, being certain of the correctness of his ideas. Twenty-one years elapsed before he openly replied to his critics by addressing two letters to Riolan, who attempted to discredit his theory of the circulation. I happen to have these letters, not in the original, but a translation, in which Harvey in a tolerant and kindly manner, combats the storm of objections to his ideas. As a man, Harvey had no enemies, though he was described as quick tempered. He did not enter into bickerings and controversy with his brother practitioners for he seemed to have been devoid of jealousy. That was the point I attempted to make in the paper.

It is true that Servetus did discover the pulmonary circulation, which is described in his book "Restoration of Christianity," printed in 1553. At the instance of Calvin, Servetus was arrested as a heretic, tried, convicted, condemned to be burned at the stake and all the known copies of his book destroyed. Almost one hundred years elapsed before a copy of Servetus' book was unearthed and later a second copy was found, these two being the only ones in existence.

By some Realdus, Colombus is credited with having discovered the pulmonary circulation, but his account was not published until six years after that by Servetus. Further there seems to be evidence pointing to the probability that Colom-

bus was aware of the discovery of Servetus. Regardless of whether Harvey knew of the work of either of these two men or not he, by experiment and inductive reasoning, was able to prove the existence of the systemic circulation. And as a result of his work modern physiology was born.

I agree that it would be extremely interesting to arrange a series lectures on medical history for students. I believe it would be stimulating and lead into paths that would prove quite profitable.

EOSINOPHILIA*

By CHARLES G. LUCAS, M. D., Louisville.

J. J., male, about 19, student, was first seen at my office on September 10th. A tentative diagnosis of a possible duodenal ulcer had been made before he was referred to me. No examination was made at the office, and he was sent to St. Joseph's Infirmary for observation.

His father was living and well. Mother had died of "brain fever." One sister was living, in good health. No brothers. Patient had measles and whooping-cough in childhood. Occasionally had had sore throat, but three years before had an attack of tonsillitis. Influenza in 1919 that confined him to bed for a week.

Present trouble began about the middle of last July. After going in bathing, was troubled with "gas on stomach," lasting 2 or 5 days. Under treatment was relieved, but while in Virginia on a visit medicine was exhausted and the trouble returned. In the beginning, he had had a "breaking out" confined to the trunk; this itched and gave some distress for three days, but there was no desquamation. However, following the ingestion of food, pain and gas would develop; there was no food relief when first seen; there was some difficulty in going to sleep, and a distinct "tired feeling" on awakening. This became much better after the first week in the hospital. He also complained of pain and much gas after food. Under medication and liquid diet, this was reduced to an ache after a few days. There was no nausea nor vomiting. He had constipation on arrival. The patient was not inclined to be nervous. Appetite was poor.

On physical examination, there was no Romberg and patellar and ocular reflexes were normal. Blood pressure was 110 over 70. The tongue was large, slightly moist, covered with thick yellow coat; the tip was red and showed many fine papillae. The mouth was well kept with moderate dental work. Nose and throat were clean. His weight was 132, compared to 150 two months before. No change in the thyroid could be detected, and

*Read before the Louisville Medico-Chirurgical Society.

repeated examinations failed to show any enlarged glands. The chest was resonant, quite well formed, and no adventitious sounds could be heard. Area of liver dullness was normal. Apex normal, heart sounds clear and distinct. In the first examination, slight tenderness was noted in the medium line, about $1\frac{1}{2}$ inches above the umbilicus. Ten days later this had disappeared, but there was some resistance under the right costal arch. Rectal examination was negative. On admission, urinary analysis showed a dark amber color; specific gravity 1030; acidity 70; absence of albumin, sugar and acetone; trace of indican; otherwise negative. The blood examination showed hemoglobin 80%; erythrocytes 4,600,000; leukocytes 18,000; color index .9; differential count—(500 cells) polymorphonuclears 21.2%; small lymphocytes 19%; large lymphocytes 2.2%; eosinophiles 57.2%. Thinking possibly a mistake had been made in the count, another was ordered for the next morning, as follows: hemoglobin 77%; erythrocytes 4,880,000; leukocytes 17,400; color index .8; differential count (200 cells) morphonuclears 16%; small lymphocytes 20.5%; large lymphocytes 2.5% eosinophiles 60.5%; large mononuclears .5%. A number of warm stools were examined, following the use of magnesium sulphate during the next few days, each negative for parasites, ova or blood. The X-ray report on September 13th was as follows: gastro-intestinal examination revealed no evidence of organic disease. The esophagus, stomach, and duodenum filled and emptied normally. The stomach is normal in size, shape and position no evidence of organic filling defect. The pylorus was somewhat spastic, but the duodenal bulb could be filled by moderate pressure, was well visualized and showed normal contour. Stomach was empty at the six hour examination. The 24-hour examination showed normal filling of the colon.

Analysis of fasting stomach contents showed 23 c. c., absence of free HCl, and a total acidity of 4. Microscopically, a few pus cells and many bacteria were found. Two days later, analysis of a test meal showed a free HCl. of 30 and total acidity of 56. Several days later this was repeated, with free HCl. of 56, combined acid 10, total 80.

Another blood count on September 23rd showed hemoglobin 78%; erythrocytes 4,520,000; leukocytes 21,600; color index .8. Differential count (500 cells) polymorphonuclears 8.8%; small lymphocytes 15.2%; large lymphocytes 2.4%; eosinophiles 73%. Repeated examinations failed to show any enlarged glands and the skin was apparently normal. The gastric symptoms became much better; where at first, only a liquid diet could be tolerated, he was now able to take a soft diet without

trouble, and, as his appetite grew better, his diet was gradually increased and he was able to take a fair variety of food at the time he left for home. He was examined very thoroughly at my office on September 26th. The blood count was as follows: hemoglobin 83%; erythrocytes 4,200,000; leukocytes 16,200; color index 1. Differential count (500 cells) polymorphonuclears 18%; small lymphocytes 28%; large lymphocytes 2%; eosinophiles 50; mononuclears 2%. Icterus index 5. His Wassermann was negative.

Owing to the fact that his physician had given him an injection of tuberculin some weeks before, Dr. O. O. Miller made a very painstaking examination of the chest, with a negative result. Three weeks after returning home, Dr. Osborne very kindly sent me three slides, which showed an eosinophile count of 21%. One week ago, the count on the second set of smears four weeks after the first were examined, showed 47%, but a letter received from the patient's father states that he is doing well, has a good appetite and has regained his weight.

The study of the blood is always a fascination but where we have such a marked change from the normal, as described in the case reported, it tests all the resources of the clinician in an effort to determine the cause. Briefly, it may be stated that the eosinophilic leucocyte is of myeloid origin, and under normal conditions constitutes 2 to 4 per cent of the total number of leucocytes, from 140 to 280 per cubic millimeter. Increase in the number of eosinophiles has been noted in a number of conditions. For example, in bronchial asthma, the blood during the free interval in most cases shows a lymphocytosis, with a diminution in the polymorphonuclears as low as 45% and an increase in the eosinophiles as high as 12%. The latter may be enormously increased in some cases, Morris Flexner, in a personal communication reporting 88% in one case. Shortly after an attack, there may be a transient disappearance of eosinophiles.

Trichinosis is one disease in which eosinophiles are greatly increased. Usually this is about the first condition considered when a high eosinophile count is made, but the high count itself is a distinct help in differentiating trichinosis from typhoid fever. In the case reported, the patient denied eating pork at any time since the trouble started—this, with the absence of puffiness under the eyes, the absence of fever, and the fact that there was no muscular weakness or soreness, caused me to exclude trichinosis entirely.

Erythema multiforme and infectious erythema are both accompanied by an eosinophilia. Early in this case, the patient had an eruption on the body, attended with some itching, but repeated examinations showed no

evidence on the skin. Other skin lesions in which an increased count has been observed are psoriasis, zoster, pemphigus, scleroderma, mercurial dermatitis and the vesicular eruption due to potassium iodide. Following the application of cantharides to the skin, increase in eosinophiles has been found in the blister fluid. In leprosy also increased counts to 60% have been noted.

Increase is also noted in malignant tumors, especially where the bone marrow is involved by metastasis.

Following injection of tuberculin, post-febrile eosinophilia has been observed.

Moderate increase has also been recorded following a malarial paroxysm.

High counts have been observed in patients the subject of intestinal parasites, although, in my own experience, the percentage rarely goes above 15. The patient in the case reported, coming from the mountains, I was confident that the stool would show some form of parasite, but repeated examinations were negative.

Quite an number of other conditions may be mentioned, e. g., a moderate eosinophilia is present in scarlet fever, in chronic tumors of the spleen and after removal of that organ. An increase has also been noted in gonorrhea, when the process involves the epididymis and the deep urethra.

Increase in the eosinophile count is at times of prognostic significance. In a recent article by Held and Goldbloom, speaking of pernicious anemia, they say "a very interesting feature of improvement is the increase in eosinophiles. They go up to 15 per cent, perhaps 20 per cent. One of our cases showed 18 per cent., the increase being maintained—the lowest count being 11 per cent."

DISCUSSION

M. J. Henry: The case presented by Dr. Lucas is very interesting, and especially so because of the thoroughness with which his report has been prepared. I can add nothing to the general subject of eosinophilia.

During the past summer I had a patient, sent in for herniotomy, and the blood count made as routine at the hospital preparatory to the operation, showed total leukocytes of 110,000, with eosinophiles varying from 82 to 90 per cent. A report of that case is being prepared and will be published later. Dr. Griffin, who has charge of all the blood work at the Mayo clinic, says it is a very rare case. The patient died and we secured permission for necropsy, with exception of the head, but this showed nothing to account for the high leukocyte count.

At the time I read everything that was available in literature on eosinophilia, and the only case approaching mine was found in an article by H. Z. Giffin, published in 1919, in which he reports a total leukocyte count of 211,000 with

79 to 90 per cent eosinophiles in a case following splenectomy for enlarged spleen. In my case, the spleen was not palpable. Reports of this kind raise the question of whether or not there is really a true eosinophilic leukemia. It has been denied by most observers that any such thing can occur, although some cases are suggestive of that condition.

When I saw Dr. Griffin about two months later he said he had investigated the literature thoroughly, that he had in mind an article published in French a year or two ago, which he thought covered a case similar to mine, but had been unable to locate it. However, in his wide experience with blood diseases he said he could not recall anything like it and did not know how to account for it.

The fact that Dr. Lucas' patient is doing so nicely would prompt one to make a blood count in his case every month the remainder of his life.

Morris Flexner: Like Dr. Henry, I cannot throw any light on the case reported by Dr. Lucas. I would like to ask what was the size of the eosinophiles, and were they young or old cells? I think the size of the cells might be of value in studying cases of this kind, and wish Dr. Lucas would say something about this in closing.

The essayist mentioned one case that I saw in Baltimore in which a man had an eosinophile count of 88 per cent, the highest I have ever seen. In Baltimore they stimulate research work of the students on the medical ward by calling attention to the fact that the first case of eosinophilia associated with intestinal parasites was discovered by Dr. Thomas Brown when a medical student working on the wards and the association between the two had never been met before.

This whole subject is intensely interesting, especially study of the leukocytes, and we always have to be certain that we are not dealing with eosinophilic myelocytes. I have seen leukemia begin with a number of eosinophilic myelocytes, which may exist for a long time before a definite diagnosis can be made.

Dr. Lucas' patient should be studied at least once per month hereafter in order to determine whether he is getting better or worse.

A. Clayton McCarty: I thank Dr. Lucas for the privilege of hearing his paper. In my experience I have not seen an eosinophile count as high as he has stated. We know that intestinal parasitic diseases will give a high eosinophile count, and we studied many of these cases in the tropics. The rule there was if the eosinophile count was around 10 to 20%, it indicated one of the many intestinal infections prevailing there. When the eosinophile count was more than 20, we looked upon it as probably due to some of the other conditions Dr. Lucas has mentioned. His case certainly seems not to belong to the intestinal type, but rather to the leukemic group.

Like the previous speakers, I believe Dr. Lucas' patient should be followed and the blood examined at intervals. The report has been very interesting and I appreciate very much having heard it.

Emmet F. Horine: I have enjoyed the unusual case reported by Dr. Lucas. I cannot offer any explanation for the tremendous increase in eosinophilic cells. While it has no reference to Dr. Lucas' paper, I may say that eosinophilia may be of some importance in the differential diagnosis between true asthma and the so-called cardiac asthma. In true or spasmodic asthma, there is an increase in eosinophiles, whereas in cardiac dyspnea or so-called cardiac asthma is no increase above the normal. That has been found true in a sufficient number of cases to make it a differential point of some value. There is no heart lesion in which an increase in eosinophiles is present, although in acute rheumatic fever there may be a slight increase in the eosinophile count.

Oscar O. Miller: I have enjoyed Dr. Lucas' paper very much, more especially so, since I had the privilege of examining the patient. The man was apparently in good health and looked well. There was no evidence of pulmonary tuberculosis on physical examination or on the stero-roentgenograph.

Hypereosinophilia is an interesting phenomenon from the fact that it occurs in relatively few diseases, all of which are readily distinguished one from another.

It is purported to occur in active tuberculosis, but it has not come under my observation. It does occur, however, frequently in experimental tuberculosis during the reaction to reinfection, which is an allergic reaction.

In the guinea pig peritoneal cavity these cells may dominate the field and 90% of them may contain phagocytosed bacilli. They also occur in large numbers throughout the course of reinfection in the guinea pig's lung. It is interesting to note that these cells are also increased in other allergic reactions, such as asthma and other phases of protein sensitization. Eosinophilia occurs occasionally in pleural exudates and in pneumothorax and they are a constant concomitant of hemothorax.

In his researches on the blood, E. Liebrech, (J. A. M. A. Vol. 76 p 1373) states that all factors which prevent coagulation, prevent the appearance of eosinophile cells. He is of the opinion that the eosinophile granules are the crystals of a substance, which crystallizes in the form we know as Charcot's crystals.

I was inclined to consider the possibility of a myelocytic leukemia in the case reported, but in a study of the slides there were no myelocytes or Charcot's crystals, the cells were of the mature type, presenting two or more nuclei; many showed three and a few four nuclei.

Hypereosinophilia has been reported in pre-

cancerous and cancerous conditions and in abdominal Hodgkins disease. While the functions of these cells are practically wholly unknown, Simon (C. E.) speaks of a septic factor designated by a neutrophilic increase associated with an eosinophilic decrease as indicative of the existence of a pyogenic infection. During convalescence from pyogenic infections, a return to normal values of the eosinophils he considers a good prognostic sign.

Gavin Fulton: I have enjoyed the paper immensely. I have just undergone an experience in which I have been unable to explain or correlate the manifestations exhibited. The patient was a woman of 73, who gave a history of having been well the most of her life. I saw her for the first time two weeks ago at which time she was complaining of persistent nausea. There was no pain, no fever, nothing except persistent nausea without vomiting. She had not lost any weight. Physical examination was entirely negative. As she seemed to be losing strength rapidly, we took her to the hospital week ago yesterday. Roentgen-ray examination was negative. A careful blood study was made with the following results: hemoglobin 80 per cent, erythrocytes 5,000,000, leukocytes 39,000 with 20 per cent eosinophiles. Thinking some mistake had been made another blood examination was made twenty-four hour later, which showed: hemoglobin 85 per cent, erythrocytes 6,000,000, leukocytes 55,000, eosinophiles 25 per cent. Three days later, or the day before yesterday, the hemoglobin and erythrocyte count remained the same, leukocytes 98,000, eosinophiles 20 per cent. The patient died last night. A careful examination was made by a competent surgeon but no pathology was found. She became rapidly weaker and was comatose several hours before death. I thought the trouble was acute leukemia probably myelogenous in type, but no myelocytes were found. This is the highest eosinophile count I have ever seen, except in disease of the spleen. There was no pathology that the surgeon or roentgenologist could determine.

Charles G. Lucas, (in closing): I appreciate the discussion. The patient whose case I reported has a very sensible father. I wrote him that I intended to report his son's case before this meeting, and he asked me to give him any further information that was obtained. I would have insisted that the patient be present tonight, but knew it was impossible for him to come. I was much interested in the case mentioned by Dr. Henry. We have discussed these two cases—his and my own—on several occasions, but no definite conclusion was reached as to the underlying cause of the eosinophilia.

My patient was examined daily during the time he remained in Louisville. His skin was repeatedly inspected under a magnifying glass, because of the fact that he had an eruption at one time, but no further cutaneous manifesta-

tions were noted.

So far as concerns the size of the eosinophiles in this case: No comments were made by my technician who made the examinations. She has been doing blood work a long time and always calls my attention to anything abnormal or unusual in the blood picture. One thing we kept constantly in mind was the possibility of leukemia. The spleen was carefully examined many times and nothing abnormal detected. We also had in mind parastical intestinal infection, since in such cases there is generally an increase in the eosinophiles, but repeated examination of the stools revealed nothing.

I had a rather interesting experience some time ago. An old lady was referred to me from a town about sixty miles from Louisville with a history quite similar to that related by Dr. Fulton. She had complained of nausea and vomiting, and her physician had made a tentative diagnosis of cancer of the stomach. Routine blood examination showed 12 per cent eosinophiles. We examined the warm stool and found the hookworm. She was completely relieved by treatment. This woman mentioned the fact that she had twelve children and would not be surprised if they all had hookworm. I advised her to send specimens of stool from each of them to the laboratory for examination, which she did and later wrote me that all twelve children had hook worm. Other intestinal parasites, such as the ameba, may also produce eosinophilia.

The case reported has been a very interesting one to me. I had a letter a few days ago from the father, stating that the boy had regained his normal weight of 150 pounds and was feeling perfectly well.

Effect of Inhalation of Tobacco Dust—Burststein states that the alkalization of nicotine from inhaled tobacco dust by the juices of the body is fairly high, averaging 60 per cent of the total nicotine content of the tobacco dust which has penetrated into the respiratory tract, and 85 per cent of that which has reached the alimentary tract. Inhaled tobacco dust exerts on the organism a nicotine action fifteen times greater than does the same quantity of smoked tobacco, provided the nicotine content of the two is the same. The degree of nicotine action on the organism from inhaled tobacco dust can be estimated thus: Each 60 mg. of inhaled dust produces on the organism a nicotine action equal to 1 mg. of nicotine when there is an average content of 2 per cent of nicotine in the tobacco dust. This relation can be more simply expressed in the following manner: From the point of view of nicotine action on the organism, 30 mg. of inhaled dust is equivalent to one smoked cigaret. The nicotine action on workmen's organisms in factories is due not to tobacco dust alone but to inhalation of the free nicotine contained in the air of factories.

RESECTION OF THE STOMACH FOR ULCER*

By GARLAND SHERRILL, A. M., M. D., F. A. C. S., Louisville.

November 7th, 1928, I saw with Dr. Voyles a man aged 45, who gave a vague history of gastric disturbances. He had been under the care of Dr. Voyles for ten days complaining of gastric discomfort, and had been treated occasionally for similar symptoms during the last two years. On November 6th he fainted in his office and vomited after inserting a finger in his throat.

The patient had the usual diseases of childhood and recovered without complications. Eleven years ago he had intestinal obstruction probably from impaction or intussusception, the exact condition not being known, and recovered without operation. Following that he had gastric discomfort at intervals, particularly after meals, but no marked distress.

Six weeks previous to the time I saw him, the patient began complaining of vague pains in the epigastrium extending around the ribs on both sides. Pain was present constantly, but was worse after meals. No vomiting, slight nausea at times, stools dark. Prior to my being called Dr. Voyles had a fluoroscopic examination and roentgenogram made. Both showed an arrest of barium in the lesser curvature of the stomach at about the junction of the upper and middle third distinct evidence of a peptic ulcer. There was a ragged appearance of the greater curvature of the stomach which appeared due to lack of complete filling. Another gentleman who read the plate thought it was suggestive of cancer. The history did not point strongly to cancer, but we kept that possibility in our minds.

Blood examination showed hemoglobin 65 per cent, erythrocytes 2,816,000. The patient was markedly anemic and rather frail. His mentality was clear, he had no evidence of lesions of the glandular system; thyroid normal, chest flat type, excursions free; no rales or other abnormalities present; heart sounds clear, regular rhythm, no bruit heard. Abdomen retracted, no masses palpable, no tenderness could be elicited over gall bladder, and only slight tenderness and rigidity in epigastrium. As the roentgenogram showed arrest of barium in the lesser curvature, the diagnosis of ulcer was made. At times the roentgen-ray will make the diagnosis for us when there are not sufficient clinical symptoms to justify a positive diagnosis without the roentgenogram.

On November 8th under ether anesthesia a medium section was made above the umbilicus. We found on opening the peritoneum that the intestines were not distended, the gall bladder

*Read before the Louisville Medico-Chirurgical Society.

was normal in size, the stomach showed induration involving the lesser curvature about the mid-point, the induration extending eccentrically from this point for at least 2 cm. The ulcer lay practically under the large vessels of the lesser curvature. The glands of the lesser omentum were enlarged and palpable, but were not hard. We decided that the pylorus was not involved in the process, but seemed to be somewhat contracted from spasm resulting from the ulcer.

The question arose for decision whether to make a posterior gastroenterostomy or to perform resection. In view of the fact that the ulcer extended almost through the wall of the stomach, being covered only by the serosa, and because the adjacent lymph glands were enlarged, it was decided to make a rather wide resection with anastomosis. About two-thirds of the stomach including the ulcer, was resected. In view of the fact that the orifice of the duodenum was constricted, an incision was made through the upper border of the pylorus according to the suggestion of Horsley so it could be sutured to the stomach wall more satisfactorily.

The patient came through the operation without any shock. He had no pain, no discomfort, no disturbances of digestion, no inconvenience and took water on the second day and liquid food on the fourth day. This is the eleventh postoperative day and he is leaving for his home tomorrow apparently in splendid condition.

Examination of the ulcer by Dr. Ball shows peptic ulcer. No evidence of malignancy.

Dr. Lucas will recall a case similar to the one narrated seen with him in consultation several years ago. The patient was operated upon and we found a peptic ulcer more extensive in type than the one I have described. We did a wide resection of the stomach and the patient lived for a number of years. His chief complaint was that he did not have quite enough room, that he could not take quite enough food into his stomach.

The case I have related shows how at times we have to depend almost entirely on roentgenographic and fluoroscopic examination for our diagnosis in ulcer cases. It also shows that an ulcer of the stomach of considerable size may not produce any great amount of symptomatology. This was a typical "punched-out" ulcer about the size of a dime, and the only thing that kept it from perforation, was the serosa with a circle of induration about it. I have seen the serosa over a space of three inches remain entirely denuded for two years, the ulcer finally ruptured in the center, after the entire muscularis and mucosa had been destroyed.

McCarthy states that an ulcer over the size of a quarter in the stomach in the great ma-

jority of cases is malignant. The one I have mentioned three inches in diameter proves that is not always the case.

MICROSCOPIC AND PATHOLOGIC FINDINGS IN CASE OF GASTRIC ULCER RELATED BY DR. SHERRILL*

By ROBERT P. BALL, M. D., Louisville.

The resected portion of the stomach exhibited was sent to the laboratory by Dr. Sherrill for examination. The ulcer can be plainly seen in the specimen. All the glands in the gastro-hepatic ligament, which remained attached to the stomach, were sectioned. The resected portion of the stomach measures 12 cm. on the lesser curvature and 16 cm. on the greater curvature. The largest end is 10 cm. in width, the smallest end 6 cm. The lymph nodes in the gastro-hepatic ligament averaged 5mm. in diameter. They were fairly firm on section. On the surface of the lesser curvature posteriorly near the upper border, there was an open crater 15 mm. in diameter and 11 mm. in depth. The serosa opposite the crater was intact, otherwise the entire thickness of the stomach wall was involved. Microscopic sections of the glands showed only hyperplasia; no evidence of malignancy. Sections through the crater showed the usual findings, that is, superficial necrosis with an underlying dense fibrous tissue infiltrated with mononuclear and polymorphonuclear leucocytes. That is essentially all the sections showed from our examination.

Viewed from the pathological side, we are discussing a lesion of which we do not know the etiology so there is little to be said. However, the histological picture of a gastric ulcer which is of the perforating type in the sense that it has extended through more than the mucosa, presents a very interesting finding that has, in our opinion, a definite bearing on the surgical treatment of ulcer.

In this specimen I first want to demonstrate to you the dense fibrous zone, grossly and microscopically, that lies around the crater just beneath the necrotic material which is on the surface of the lining wall. This ulcer in order to heal, would of necessity heal by secondary intention or by means of granulating tissue. It would not be likely that granulating tissue would fill this crater and produce healing or union, because of the gaping lesion admitting the gastric juices, and allowing their digestive action to take place. In other words, the firm rigid wall of the ulcer will not collapse and remain open to the deleterious action of gastric juice. It is because of this obvious state of affairs that we believe nothing but excision offers a favorable prognosis.

*Read before the Louisville Medico-Chirurgical Society.

regarding the etiology of this type of ulcer, of course it is purely problematical. However, there is one feature about which probably all of you agree, that is in the beginning of the ulcer there must be necrosis of the superficial epithelium and possibly also of the submucosa. If the area of necrosis is very small, healing by primary intention would be possible, say, for instance, a small lesion the result of trauma; but if there is a certain amount of contusion of the wall and necrosis occurs, then it would heal only by secondary intention which is very difficult and unlikely in this location.

I would like to mention, in this connection, an ulcer of the stomach seen a few days ago and which I consider a rare specimen, because it is the only case I have ever seen that is a peptic ulcer of luetic origin. I had often wondered what the picture might be. This specimen was sent to the laboratory from the Norton Memorial Infirmary for examination. There was an annular-like ulcer, which extended almost entirely around the circumference of the stomach; it only lacked about 3 mm. of completely encircling the stomach. The edges were ragged and inrolled in that the ulcer was not of oval form. In depth the ulcer extended only through the mucosa. In several areas there were islands of mucosa present.

This ulcer is interesting from another point of view, that is the favorable prognosis for healing as compared with the deep crater which is unlikely to heal. When the stomach is empty this ulcer, because of the absence of fibrous tissue in the wall and because of its superficial lesion with tissue exposed to the gastric juice which is more resistant than the muscularis or fibrous tissue, offers a much more favorable prognosis than the perforating type of peptic ulcer. Viewed from the anatomical and physiological aspect conditions are more favorable for healing.

DISCUSSION

L. Wallace Frank: Dr. Sherril has presented a most interesting case, and I want to congratulate him on the outcome. His report raises the question of the treatment of gastric ulcers including those occurring near the pylorus. I think there is unanimity of opinion among surgeons that ulcers of the stomach should be eradicated either by excision, by sleeve resection, or by partial gastrectomy, combined with either the Polya method or the Billroth No. 2.

The fact that a large percentage of ulcers the size of a quarter show malignant degeneration has been well established by McCarty and substantiated by other observers. This in itself is sufficient reason for the statement that radical surgery should be employed. Furthermore, the result of gastroenterostomy is not so good for ulcer of the stomach proper because gastroenter-

ostomy primarily simply facilitates drainage of the stomach. The ulcer does not obstruct the outflow of gastric contents and one would expect only a quicker emptying with rapid diminution of acidity. Consequently the treatment has resolved itself into removal of the ulcer by one means or another.

When we begin discussing duodenal ulcer the field becomes wider and wider. The question before us is, what shall be done with those ulcers occurring on the other side of the pyloric opening? While duodenal ulcers bear no direct relationship to the type of case under discussion, yet it seems we must consider them in speaking of the surgical treatment of ulcer in general. There has been in the last eight or ten years a general move, instigated perhaps by European surgeons, to perform partial gastrectomy for the cure of duodenal ulcer, with the idea that ulcer is due to high acidity and that with removal of the acid-bearing glands in the lower part of the stomach together with the ulcer, the likelihood of marginal ulcer will be greatly diminished. The statistics of several observers have shown that marginal ulcers occur as frequently as in 35 per cent of cases after gastroenterostomy. My personal observation has been that these figures are much too high. I believe our statistics agree with those of a number of large clinics throughout the country, namely, that the incidence of marginal ulcer is nearer 5 or 8 per cent than 30 or 35 per cent. With that in view and the fact that the mortality of partial gastrectomy is much higher than following gastroenterostomy, and since it has been rather conclusively demonstrated that cure of duodenal ulcer will occur in 70% of cases after gastroenterostomy alone, and associated with local excision of the ulcer cure will result in about 95 per cent of cases, I cannot see the rationality of performing partial gastrectomy for duodenal ulcer. Furthermore, there was reported before the American Surgical Association in Washington last May by a surgeon from a large American clinic six or eight cases of marginal ulcers which occurred after partial resection of the stomach, some of the ulcers occurred in the suture line after the Polya operation and others were found in the jejunum. I do not recall the total number of cases in his series, but if we are going to have jejunal ulcers and marginal ulcer following gastric resection then I certainly think that in duodenal ulcers, a very small percentage of which become malignant, the radical procedure of partial gastrectomy is not the method of choice and the more conservative method should be employed. But in cases such as that reported by the essayist, i. e., gastric ulcer, where we know or have good reason to believe that probably 20 per cent of them undergo malignant degeneration, I think the ulcer with the surrounding tissue should be eradicated by one means or another. The method to be employed

must, of course, be left to the surgeon, because he is aware of the local condition and he is also aware of the general condition of the patient.

Charles C. Lucas: Gastric ulcer is a subject in which I am very much interested. The discussion reminds me of the old days when we first began discussing the subject of appendicitis. I am sorry I did not hear all of Dr. Sherrill's report, but he told me about the case about two weeks ago. I recall another patient operated upon by Dr. Sherrill some years ago, a woman who had a large gastric tumor and everyone who saw her thought the case was inoperable. Gastro-enterostomy was performed, the woman recovered and Dr. Sherrill showed her before the Louisville Surgical Society a year afterward.

Dr. Frank has covered the subject thoroughly, but I have been very much impressed with the work that is being done at the Mount Sinai hospital. They have a most wonderful follow-up system. They have tabulated and followed all the patients upon whom gastroenterostomy was performed for ulcer, and the results showed that only about 50 per cent of them were well. At the meeting of the American Gastroenterological Association last year in Washington, the Mount Sinai people, especially Dr. Lewisohn, were very enthusiastic on the subject of partial gastrectomy for both duodenal and gastric ulcers, and claimed the results were much better than following gastroenterostomy. Several others also took the view that if resection could be safely performed it was the operation of choice.

Another case of unusual interest was in a man whom I first saw 20 years ago and made the diagnosis of ulcer. We had a disagreement and I did not see him for some time, but he finally fell into my hands again and it was decided to operate. Two roentgenograms had been made in a large clinic and the lesion was thought to be malignant. Dr. Irvin Abell performed a sleeve-resection removing two-fifths of the stomach. The pathological report showed ulcer with no evidence of malignancy. At the time of operation we noticed a small ulcer of the pylorus. The man was a "Tom-and-Jerry" habitue and about a year afterward he began having evidence of pyloric obstruction and six months later he was again operated upon. It was very interesting to note the small white line extending across the stomach showing where resection had been performed. At this operation the surgeon performed gastroenterostomy. That was twelve years ago. I see the man every week or two and he is getting along wonderfully well.

About three weeks ago I saw a man of 47, who said he had been complaining of gastric distress only two weeks and had consulted no other physician. Investigation of his history showed that he probably had been having symptoms for four months or longer. After examination I made the working diagnosis of cancer of the liver. He

had ascites but no jaundice. Icteric index 4.2. Gastric analysis showed contents about 15 c. c. with four-plus blood reaction. The stomach irrigated and a test meal given which was removed in one hour. This showed four-plus blood reaction, total acidity 10, no free hydrochloric acid. He had only slight anemia. Roentgen-ray examination showed a large filling defect in the lesser curvature. His abdomen was tapped and one and half gallons of bloody fluid removed.

The abdomen was opened under local anesthesia. The entire abdominal cavity had the appearance of mother of vinegar. The Wassermann blood reaction was four-plus. The pathological report showed adenocarcinoma. The man was returned to bed in good condition and the administration of neosarsphenamin begun. After recovery from the operation the abdomen was again tapped and one gallon of fluid removed.

The study of gastric lesions is very interesting, but as I get older I believe resection for ulcer gives the best results. I have not now as much confidence in gastroenterostomy in the treatment of duodenal ulcer as I had eight or ten years ago. I have under observation a man who was operated upon for ulcer by a celebrated Eastern surgeon. His symptoms recurred but he absolutely refused to consider further operative measures. I have given him as high as 25 drops of tincture of belladonna without much relief, and finally began using benzol benzoate. Under this treatment he is getting along very nicely. In a certain percentage of cases the symptoms recur.

J. Garland Sherrill, (in closing): One of the main reasons for presenting the case narrated was the difficulty encountered in making the diagnosis. The roentgen-ray findings are not always typical in ulcer of the stomach. The clinical history should be our guide in the majority of instances checked by roentgen-ray examination. However, the findings in this case point to the value of careful roentgen study in gastric lesions.

It is my opinion that Berg and Lewisohn are too radical in their contention for partial gastrectomy in all cases of gastric ulcer. I have seen some wonderfully good results from gastroenterostomy, and sometimes advise sleeve-resection for ulcer at the pylorus when indicated. If the ulcer cannot be safely removed gastroenterostomy should be performed in the attempt to secure relief in that way. Gastroenterostomy does this: it facilitates drainage of the stomach when ulcer exists near the pylorus or in the duodenum. In other words it removes the acid secretion nearly always present in the stomach at the site of the ulcer before it reaches the ulcerated area. It does more than this: it promotes the emptying of the stomach which permits the edges of the ulcer to come closer together as the stomach becomes flaccid and thus encourages healing. If the edges of the ulcer

are kept apart by distension healing is a very slow process. If the walls of an evacuated abscess, for instance, be allowed to collapse and be in approximation, healing occurs much more rapidly. That point has not been sufficiently emphasized in the treatment of ulcer.

The influence of hyperacidity in the causation of gastric ulcer has not yet been definitely determined. Some later writers claim to have shown by investigation of a resected stomach that the acid-producing glands are situated not only in the lower portion and near the pylorus, but also in the cardia. If that be true then the bone of contention about the removal of ulcer is gone.

How are we to handle ulcer of the stomach? The first thing that occurred to me in the case described was to cauterize the ulcer thus destroying the necrosed tissue and leaving the approximating edges of the ulcer healthy so they could come together and unite. The question was, would this procedure give the patient a better chance of recovery than resection? The presence of enlarged glands and the fact that the entire wall of the stomach except the serosa was involved caused me to decide in favor of resection. Another factor which influenced my action was that the ulcer lay almost directly under the large blood vessels along the lesser curvature; it was therefore not amenable to the use of the cautery because we might have excited secondary hemorrhage and in that way reduced the chance of recovery of the patient. For these reasons I performed sleeve-resection and did not in addition make a posterior gastroenterostomy.

One of the first cases of this kind coming under my observation was in a man who had two ulcers of the stomach. Resection was made so near the esophagus that it was impossible to bring the stomach down through the fold of the mesocolon in order to suture the jejunum to it. Therefore, as described in the report of that case which has been published, the jejunum had to be brought upward through the fold of the mesocolon so the attachment could be made. This was more easily accomplished than it would have been to bring the stomach down in the ordinary way.

It is my belief that the occasional failure of gastroenterostomy to relieve symptoms in the majority of instances is due to improper placement of the opening and consequent inefficient drainage. The opening should be made as nearly on a line with the esophageal orifice as possible, large enough to permit free exit of the material into the intestine, and so placed that drainage will be into the intestine below rather than toward the duodenum. If this plan is followed failures will be few especially in those cases in which the duodenum is occluded.

The question of luetic ulceration of the stomach is an important one. It has always seemed

to me that we should be able to determine whether or not the ulcer was luetic by finding the spirochaete. If no spirochaetes be found we would hardly be justified in stating that the ulcer is luetic in origin.

Within recent months I observed at operation a constriction of the ~~third~~ portion of the duodenum the result of a tuberculous ulcer, something I had never seen before at this location nor had noted mention of such a lesion be found in literature. The patient was an adult woman weighing only 67 pounds. The duodenum was opened and stretched to normal size with the finger. Resection was contemplated, but was not performed because of the presence of multiple glandular enlargements. A few of the glands were removed and submitted to the pathologist, who found they were tuberculous. After operation, however, she improved and within three weeks had gained 23 pounds. The patient later began to fail and subsequently died from tuberculous peritonitis, tuberculosis of the mesentery and tuberculosis of the intestine.

MESENTERIC TUMOR WITH INTESTINAL OBSTRUCTION*

By LOUIS FRANK, M. D., F. A. C. S.
Louisville.

I want to present this specimen largely on account of its possible unusual character, and because we so rarely encounter tumors the size of this one in the location where this growth was found. The history of the case is briefly as follows:

E. S., a male, aged 28 years, from Tennessee, was referred to us by Dr. Cooper on September 27th, 1927. He was brought here late in the evening complaining of intense pain in his abdomen with the diagnosis of appendicitis with secondarily a periappendiceal abscess.

At the time of his arrival here he was too ill to indulge in much conversation and we were able to get very little information from him. After convalescence was established we obtained a more complete history.

During childhood he had had some intestinal disturbance which was thought due to worms. This trouble continued until he was sixteen years of age. He was also constipated. At the age of sixteen a "lump" appeared in the upper left side of his abdomen between the ribs and the umbilicus. The tumor gradually enlarged and changed its position to the right side of the abdomen, where it has been ever since. The growth has been painful at times. He has never had any fever. The mass remained as it was with occasional attacks of pain until August, 1922, at which time he developed acute pain in the abdomen

*Presented With Patient Before the Louisville Medical-Chirurgical Society.

and symptoms similar to the present trouble. The diagnosis of gall bladder disease was made at that time. Since August, 1922, he has had no pain nor discomfort, he has felt perfectly well except for a sense of weight in the abdomen.

Four days previous to our seeing him, or on September 23rd, 1927, following a very heavy meal, he suddenly developed pain throughout the abdomen which later localized about the mass in the right side. He vomited frothy material and also what his doctor thought was pus. His right leg became numb, pain continued, growing worse, until he was admitted to the hospital.

Previous to the onset of present trouble, four days ago, his appetite had been good. He rarely had indigestion, and his intestinal function, except for constipation in early life, had been normal. He has never had any cardiac, pulmonary nor urinary symptoms. He had been losing weight for about six months before he came to us.

When he came in we obtained merely a history of pain in the right side of the abdomen which finally became localized, with a gradually developing tumor which had continued to increase in size.

On physical examination there was practically nothing of note except with reference the abdomen itself. The abdomen was flat and just below and a little to the right of the umbilicus there was a mass the size of a grapefruit which was exquisitely tender. The muscles over the mass were rigid. Slight general tympany and tenderness with some little general rigidity. Peristalsis was present and active. The mass felt somewhat fluctuant in character. In the absence of a more complete history we agreed that he might have a periappendiceal abscess, that the tumor was probably the appendix surrounded by the omentum. I have seen omental tumors this high in the abdomen and thought that was what he probably had. The blood count at this time showed: erythrocytes 5,000,000, leucocytes 25,000, with 93 per cent polymorphonuclear cells.

The patient was operated upon the same evening. Upon opening the abdomen there escaped quite a quantity of free fluid, which was not bloody, but a yellowish color. We first made a small incision exposing the mass, which apparently resembled a very much enlarged gall bladder embedded in adhesions and surrounded by an area of acute peritonitis, in other words, there was a dense plastic exudate covering the mass itself. We then enlarged the incision to eight inches extending upward to the border of the ribs, believing the mass a greatly enlarged gall bladder. Further exploration revealed that the mass was not connected with the liver nor in or from

it. An enlarged right kidney was then considered, but examination of the right renal fossa showed that a normal sized kidney was present. The next thing that impressed me was that this might be an enlarged wandering or so-called ectopic spleen, but examination disclosed the presence of a normal spleen and also a normal sized kidney on the other side.

We then concluded the best thing to do was to lift the mass out of the abdomen, and this was rather easily accomplished, although there was a very broad pedicle. On the under side we found incorporated in the mass a coil of the small intestine. This was completely hidden behind the growth and could not be seen until the mass was turned out of the abdomen. To relieve the obstruction and remove the tumor, it was evident the mass was mesenteric, the bowel being incorporated in it and obstructed. We resected about sixteen inches of the intestine, going to the base of the mesentery, and did an end-to-end anastomosis by the Kerr aseptic method.

Just what is the character of the mass I do not know. I have some photographs of it taken while the specimen was fresh, which may be of interest. The patient made a fairly smooth convalescence except for slight infection in the wound probably due to the fact that the fluid in the abdomen had become contaminated from the intestine. It was absorption of poisonous products that was unquestionably the cause of the acute symptoms. He made a very nice recovery as will be shown from the temperature chart which is exhibited.

Dr. Stuart Graves has made a number of sections from the tumor and I hope will tell us what he found. A culture from the growth taken at the time of its removal showed no growth after thirty-six hours incubation.

The first report from Dr. Graves after the examination of three sections reads: edema, congestion, hemorrhage and subacute inflammation. His second report shows gross and microscopical diagnosis, hematoma with acute and subacute inflammation. Another report states, edema, hemorrhage, acute inflammation, leucocytic reaction, subacute inflammation, no evidence of neoplasm. Other reports show, connective tissue, subacute inflammation, but no evidence of neoplasm.

I thought probably after removal of this tumor that it was a sarcoma. We noticed one or two small lymph glands in the specimen, which we thought were part of the growth. I do not know exactly what the tumor is. There have been about one hundred cases of tumors of the mesentery reported. Fibrous tumors of the mesentery are exceedingly rare. I think the latest paper on this subject was by Judd

who reported one case. The mortality from their removal has been exceptionally high varying from 15 per cent to 50 per cent. Intestinal resection has been necessary in the majority of these cases. Isolated mesenteric tumors of this size must be exceedingly rare. Correct preoperative diagnosis is seldom possible. I think though that we should be able to make a correct diagnosis in these cases. We might mistake the tumor for a renal neoplasm clinically, but with the methods of investigation now at our command, pyelograms, ureteral catheter, renal function tests, etc., we should be able to exclude renal tumors. With the modern methods of examination, likewise, we should be able to differentiate mesenteric tumor from gall bladder enlargement. Given the time with no acute symptoms I believe we should be able to recognize these tumors. However, very few of them have been definitely recognized prior to operation.

The case reported was an exceedingly interesting one to me. We made the provisional diagnosis at the time of removal of retroperitoneal sarcoma. I doubt now whether the growth is of that type. I do not believe it is a tuberculoma as we have been unable to find anything to indicate a tuberculous growth. In tuberculous glands of this size there is always evidence of calcareous degeneration of calcification in some parts of the growth. This tumor has been opened freely in all directions and nothing indicative as to its exact character found. The tumor had been present for a period of twelve or fifteen years, then the patient suddenly developed an attack of acute pain and the mass began to enlarge, but there was no obstruction to the fecal outflow. In some cases fibromata are wandering growths. This tumor was purely mesenteric in that it developed between the folds of the mesentery behind the intestine. We removed the growth to the root of the mesentery and then did an end-to-end anastomosis of the intestine. The patient had a little trouble for a few days from obstruction probably because we infolded too much of the intestinal wall. Later the infolded portion disappeared and after that there were no further symptoms.

DISCUSSION

Stuart Graves: This is one of the most puzzling pathological specimen it has ever been my good luck to study. I cannot say anything positive about it further than to express the belief that it is an inflammatory mass and not a true neoplasm. That agrees with some of the clinical symptoms, the temperature of 103° F., the leucocyte count of 25,000 with 90 per cent polymorphonuclear cells, and relief of symptoms after the operation.

When the specimen was sent in it was accompanied by the usual clinical history slip and a

note from Dr. Louis Frank, asking us not to destroy any more of the specimen than necessary. We took sections from the mass without disturbing the relationship of the tissue any more than necessary to make the diagnosis and in order to preserve the specimen to the best of advantage. The first three or four blocks of tissue were removed by simple incision in the side of the mass opposite the intestine. From the superficial appearance of the outside of the specimen, we concluded before making any extensive incision that there was no part of the neoplasm, if such existed, in the wall of the intestine.

The first microscopic section showed fat and connective tissue with necrosis and hemorrhage and more or less diffuse reaction of leucocytes in which the polymorphonuclear type predominated. There were also a large number of endothelial leucocytes, lymphocytes and plasma cells, giving the picture of subacute inflammation with retro-grade changes. On that basis we made the diagnosis of acute and subacute inflammation with retrograde changes, hematoma, no evidence of neoplasm.

Dr. Frank concluded that the clinical symptoms and pathological report did not agree and asked for further examination. The result was he gave us permission to make further incisions into the specimen. We then split the mass from one end to the other and took several blocks of tissue from various areas. These showed very much the same picture already described and we again reported to Dr. Frank our belief that it was not a neoplasm.

I asked Dr. Frank if he would not select some blocks of tissue from parts he thought most suggestive of neoplasm, and blocks were cut which he indicated so they would definitely represent the portions he wanted examined. These sections gave similar findings as before with this exception: in the last section studied, in the midst of some of the tissue under examination, there were found some small lymph nodes in what appeared to be inflammatory tissue. These lymph nodes were perfectly circumscribed and gave the histological picture of subacute inflammation. We then opened the intestine from one end to the other so as to examine the mucosa. This appeared, so far as I could determine, perfectly normal.

We then made further examination of the relationship of the intestinal wall to that part of the main mass that had not yet been opened by incision. We made a number of incisions in the intestine through the wall toward and into the mass. There was no evidence of any neoplasm.

So far as concerns the microscopic appearance of all parts of the specimen, a considerable number of sections in series of three to four blocks of tissue were carefully examined and there was no evidence of neoplasm.

I appreciate that this is not a very satisfactory

report to the surgeon, as he wants to know what the specimen is and wants the diagnosis in positive terms. All I could do was to state positively some negative findings. However, I then worked backward, as one always should, to consider all the possibilities and try to make a differential diagnosis. So I considered the possibility of neoplasm from the three different kinds of tissue that were fundamental in this specimen.

First was the intestine, and here we considered the epithelium. There was no evidence whatever grossly of any neoplasm. The mucosa was apparently normal in thickness and the surface was not remarkable. The junction of the mucosa to the walls of the intestine seemed to be perfectly normal. The wall of the intestine contains connective tissue, but there was no evidence of neoplasm of that type. Sometimes we have fatty tumors of the small intestine attached to the wall. These are very rare. Except for the main mass outside of the intestine there was no evidence of lipoma, so we could exclude neoplasm of the intestine.

We next considered the mesentery of the intestine. There we have to consider fatty tissue tumors and connective tissue tumors. There was no evidence of any such neoplasms. Then we might consider lymphoid tumor arising from the lymph nodes in the mesentery. I have never seen a lymphoid tumor anywhere near the size of this. We sometimes get a fairly good-sized mass in the mesentery with a group of lymph nodes, but not one so large as this. All the microscopic sections were entirely against lymphoid tumor. We can further exclude lymphoid tumor because in some of the sections from this mass we found perfectly definite small lymph nodes with a picture of inflammation in the nodes and in the surrounding tissue of this mass. Reasoning from the standpoint of possibilities of the gross appearance and microscopic sections from all parts of the mass there is no epithelial type, fibrous type, fatty type, connective tissue type or lymphoid tissue type of neoplasm present. All the lipomata I have ever examined have been simply a mass of fat. There is nothing typical about any particular section of fat because it resembles closely normal fatty tissue, and it is only by overgrowth that we have eventually a circumscribed fatty tumor of characteristic consistency and color. The fatty tissue all through a lipoma would be of the same character, at least I never heard of such a tumor having lymph nodes incorporated in a mass of fat with an inflammatory process all through it. So I am conclusively of the opinion that there is no neoplasm.

As to the possibility of tuberculosis of the lymph nodes: The picture of tuberculosis is usually fairly characteristic. We may have sometimes very extensive areas of necrosis due to degenerative processes in tuberculous lesions, or we may have extensive fibrosis, calcification,

necrosis and fatty changes. Yet I would not make the histological diagnosis without demonstrating the tubercle bacilli or being able to outline small tubercles with characteristic tissue reaction around them; fibrosis plus lymphoid cells, endothelial cencocytes and foreign body giant cells. In this specimen we have no giant cells, we have the picture of simple inflammation associated with retrograde changes, necrosis, hemorrhage, edema, congestion, etc. That is what all the sections have shown from all parts of the mass. There is fatty tissue and here and there some connective tissue as one might expect, but the whole picture is dominated by necrosis, hemorrhage, diffuse cellular reaction of lymphocytes, leucocytes and polymorphonuclear leucocytes; the picture of diffuse simple subacute and acute inflammation bordering on chronic inflammation.

I am still as far from a definite diagnosis as when I started except that neoplasm is ruled out and subacute and acute inflammation is ruled in. There is no relationship between the mass and the wall or any part of the structure of the intestine. It does not look like a mass of mesentery because it is perfectly circumscribed. It is on the side of the mesentery, but the mass itself is definitely ovoidal in shape and seems to be covered with serosa and the surface is smooth. As you cut it open and examine all parts of it, first through the longitudinal axis and then by cross sections you can see extensive areas of fat rather bright red in appearance in places but with irregular areas of dark red and brownish-black which indicate old blood.

I am inclined to the belief that the mass is composed of fat consisting of a portion of the mesentery that has become swollen and edematous by reason of inflammatory reaction, rather than a fatty tumor. There is no reason to believe it is tuberculous. I cannot conceive of a tuberculous mass that would not show other evidences along the intestine or lesions in the lung or elsewhere. There is nothing to indicate tuberculosis so far as the physical examination is concerned, and I understand the operation disclosed no evidence of tuberculosis elsewhere in the abdomen. So I am forced to the conclusion that it must be a mass of mesentery that has become swollen and distended so as to give the appearance of a tumor.

After that line of reasoning, which is indirect, I think there are two conclusions: (1) That it is not a neoplasm except possibly a lipoma and it is probably not a lipoma. (2) That it is an inflammatory mass with retrograde changes and subacute, acute and chronic inflammation without evidence of tuberculosis or syphilis.

Louis Frank, (in closing:) In the case reported there was no history of trauma, nor did we get a clear history of the abdominal mass until after the operation. On admission the man was acutely ill and the history as we ob-

tained it was that in 1922 he had some intra-abdominal disturbance with the formation of a lump in his side which his physician thought was the gall bladder. He had not been ill since that time until the present attack which began four days before we saw him. The man is a barber with a family and had been fairly active. It was not until he became convalescent that we secured the major portion of the history related.

Most of the tumors of the mesentery which have been removed have begun on the left side and finally located as this one did, on the right side. This fact is shown by the literature of the subject. I believe Dr. Graves also thought the origin of the mass was below the duodenum. It may have come from the jejunum, at any rate that is where we thought it arose. I think the tumor is probably enlarged lymph glands because of its long duration (ten or twelve years) during which it was palpable at all times. There were a number of small lymph nodes at the base of the growth and some of them were removed. It may have been that this was an enlarged mass of lymph glands in which sudden hemorrhage took place and edema occurred from pressure. The mass looked like it was becoming gangrenous in certain areas. We did not examine the free fluid in the abdominal cavity as we should have done. The man had beginning peritonitis yet culture showed no organisms after thirty-six hours. The culture was sterile after this length of time. There were systemic reactions resembling those from bacterial infection, despite the fact of no bacterial growth by culture.

The case has been one of extreme interest to me. I hope Dr. Graves will examine additional sections and be able later to throw further light on the subject. I thought the case history, even though incomplete, was worthy of consideration. All of us at times have unusual cases that we should report for the benefit of those who may be interested. Just what this mass I did not know at the time of operation, and confess I do not know now.

Quite recently we saw a woman of 55, who had no evidence of a tuberculosis elsewhere, yet had a large mass in the axillary region, probably composed of all the lower axillary glands, just under the skin overlying the pectoralis muscle. This mass was removed and on section showed definite areas of tuberculous involvement which had already undergone caseation. The mass was the size of an orange. The woman had no elevation of temperature at any time. I think it would be worth while to examine sections of this growth for evidences of tuberculosis. It is possible that tubercle bacilli might be discovered in the tissue.

In connection with tumors of the mesentery: I had occasion eight or nine months ago to see a patient who upon examination presented a very tender mass well down in the left iliac fossa, unaccompanied by any elevation of temperature.

The tumor-mass was not movable. Roentgen-ray study showed there was no filling defect at this point, but here was obstruction of the intestine always at the same place. The mass was distinctly palpable and the patient had been losing weight for some time.

Operation was performed under the belief that we were probably dealing with malignancy of the sigmoid or some portion of the large intestine. Upon opening the abdomen there presented a mass which seemed to be composed of lymph glands; it was distinctly inflammatory and adherent to the outer side of the pelvic wall. The mass was about the size of a lemon, $2\frac{1}{2}$ inches in its long diameter and 2 inches in its short diameter. I thought the growth was inflammatory, but upon incision no pus was liberated. It seemed to be simply an enlarged lymph node. Of course, I thought of diverticulitis, but examination disclosed no evidence of a diverticulum. A cigarette drain was inserted and the abdomen closed. There was considerable purulent discharge from the wound, and the patient sufficiently recovered to leave the hospital in twelve days. She reported at the office at various periods for two or three months. At her last visit she presented a sinus that did not look healthy in that the margins were inflamed. For the purpose of exploration a probe was introduced and a foreign body felt. The sinus was dilated with forceps and the body removed. It proved to be a fish bone $1\frac{3}{4}$ inches in length. She had evidently swallowed this fish bone which had traversed the intestinal tract to the lower colon, either perforated or embedded itself in the wall and there caused the development of the inflammatory mass which was cut into by me. The fish bone was probably caught in the tissues and was not extruded until after suppuration had caused separation.

The symptoms in this case indicated intestinal obstruction from malignancy and the operation was performed with that diagnosis in mind, yet it proved to be a benign even if an unusual affair.

Referring again to the mesenteric tumor case reported, we would cite the following from article by Ransohoff and Friedlander (*Annals of Surgery*, vol. LXXIII, p 211, January, 1921):

"Solid tumors of the mesentery, though frequently described, are of sufficient rarity to warrant individual case reports, particularly when the case presents unusual features. In examining the reported cases there is a striking similarity in certain salient points in the histories. The diagnosis is rarely made even in cases unaccompanied by obstruction. The mortality in the operated cases is extremely high, and the question always comes up at operation whether to remove the tumor from the mesentery or to do an intestinal resection.

Arising as they do from the connective tissue within the mesenteric leaves, these tumors are

invariably of the connective tissue type of tumor; fibroma, fibro-myoma, lipoma and sarcoma. One case has been reported of a neuro-fibroma. The few reported cases of carcinoma are undoubtedly secondary to a primary carcinoma of the intestinal wall, spreading into the mesentery by continuity of tissue. The primary retroperitoneal sarcomata which grow between and push apart the leaves of the mesentery must be both clinically and pathologically differentiated from the primary mesenteric sarcoma. Pathologically the primary mesenteric sarcomata are nearly always fibro—or spindle-celled, while the primary retroperitoneal sarcomata which secondarily invade the mesentery are, as a rule, small or large round-celled.

The first mesenteric tumor successfully treated by operation, a cyst, was reported by Tillaux, in 1880. In an exhaustive study in 1906, Vance collected 27 cases reported in the five previous years. Of these, 7 were sarcomata, 1 carcinoma, and the rest benign tumors of neoplastic origin. In the 27 cases in which operation was done, 11 died, a mortality of 40.7 per cent. Resection of the overlying bowel was done in 13 cases, with a mortality of 46 per cent. From these figures it is evident that intestinal resection only slightly increases the mortality of the operation. An interesting feature in Vance's cases is that of the sarcomata coming to operation, only one survived the operation. Since Vance's article, numerous individual cases have been added to the literature.

Without an exhaustive study of the literature, we have been able to collect about fifteen subsequent cases. A striking feature in all is the almost invariable failure to make a diagnosis, and the entire absence of the x-ray reports.

In those cases which appear with the syndrome of an acute intestinal obstruction, diagnosis is out of the question, as the symptoms of obstruction entirely mask the underlying condition. In cases, however, in which the operation is done a *fibroid*, the diagnosis should at least be suspected. These tumors have one feature in common, that is their mobility. In nearly all instances, except where it springs from the rectosigmoid junction, the tumor is freely movable and can be pushed from side to side in the abdomen; as a rule, painlessly. This mobility they have in common with most ovarian cysts, omental cysts and pedunculated fibroid tumors. The age of incidence is of no significance in the diagnosis, as these cases have been reported at all ages.

Biglow and Forman reported a case in a child of six years. Bilisario, a case of mesenteric cyst in an infant less than a year old. In Bevan's case, in spite of the enormous size of the tumor, the diagnosis before operation lay between a mesenteric sarcoma and an omental cyst. For self-evident reasons the diagnosis of these cases is far more difficult in women than in men. The x-ray findings are of extreme im-

portance, except in tumors springing from the small intestine, since these have neither definite anatomical nor x-ray location. However, the large intestine, both from an anatomic and x-ray standpoint, has a well-defined position, and any gross variations are easily detected, even in the absence of obstruction. For example, a normally filled transverse colon, with a sharp curve deflected upward, combined with a movable tumor in the central abdominal area, would certainly suggest a tumor of the transverse mesocolon. In the same way, a movable tumor in the lower left abdominal quadrant, combined with a radiographic picture of unusual sigmoid looping, would undoubtedly suggest a tumor of the mesosigmoid.

An important question which can only be settled during the operation is that of intestinal resection. Though resection undoubtedly slightly increases the operative mortality, it must be done if there is any doubt as to the viability of the bowel. In Biglow's case the failure to resect was proven by post-mortem to be the cause of the fatality, as there was a necrosis of the intestine following an interference with its nutrition. These tumors are usually so closely connected with the blood supply of the overlying intestine that there is great danger in interfering with the viability of the bowel through the removal of the tumor. As in strangulated hernia, if in doubt, resect.

UROLOGICAL PROBLEMS AS SEEN IN GENERAL PRACTICE*

By IRWIN H. CUTLER, M. D., Louisville.

It is interesting to conjecture what we would do, in the majority of our urologic cases, if we had no laboratory, no cystoscope, no renal function tests, no roentgen-ray, nor other appurtenances that are available to present-day practitioners of medicine. Naturally none of us would care to return to that remote era of darkness, and yet, with all the scientific aids, the specialist is confronted with a tremendous task when he attempts to make accurate diagnosis in urinary disorders.

The general practitioner who first sees the patient and who is often acquainted with his history and temperament, should, in the very nature of things, be of assistance; but, his difficulties are even greater, as he is compelled to grope in the dark, since with the exception of urinalysis the urinary tract is inaccessible to the simpler methods of examination. Furthermore, the physician is handicapped by the multiplicity, the peculiar and puzzling character of urologic symptoms or those due to uropathy.

No portion of the human organism is so small or remote that it may not contribute to

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the array of symptoms related by the urologic patient. It is not uncommon to encounter individuals who have never suspected the presence of urinary disease, inasmuch as their symptoms are referred to other regions, such as the gastro-intestinal, the circulatory, or the nervous system. Oftentimes they suffer from latent lesions in the urogenital tract, producing effects in distant parts; or an apparently mild local disorder masks grave renal or vesical affections.

Since the discovery of the cystoscope and the ureteral catheter, the introduction of urography, renal function tests, blood chemistry studies, and the subsequent refinements in the diagnosis and treatment of disease of the urinary system, urology has made phenomenal advancing strides, and may now be considered a full-fledged specialty of untold assistance to the physician. It is only by co-operation between the general practitioner and the specialist that progress has been and will continue to be made in the care of the sufferer from urogenital disorders.

The public is becoming educated in the matter of consulting the physician early in various diseases, and especially does the man or woman afflicted with urinary lesions summon the physician in the hope of ultimate cure.

It is the duty of every physician to search for the cause of hematuria, pyuria, renal colic, or an enlarged kidney. In every-day practice one should remember the possibility of urinary disease in every obscure abdominal case, and elicit details from the patient that may throw light on the subject. I believe every patient complaining of abdominal symptoms should have the benefit of urinalysis, including microscopic investigation and also rectal examination.

Blesh (1) reviewed 5,000 cases of appendicitis and found that 40 per cent of the patients were still complaining of the symptoms for which operation had been performed.

Hunner (2) has said that ureteral stricture is one of the commonest causes of abdominal pain in the female, and provoking more needless surgery than any other condition.

Goldstein and McBee (3) have emphasized the importance of making a urological examination in obscure abdominal lesions, in patients who have been operated on without relief, and in every case of intra-abdominal tumor.

Where definite urogenital lesions are suspected, but the symptoms are of obscure origin, urologic examination, including ureteral catheterization and pyelography, should be made early before marked destruction has occurred, for, generally speaking, renal lesions have a tendency to progress. In every case of

renal tuberculosis, neoplasm, pyonephrosis, or prostatic obstruction in an elderly man, there was at one time an incipient stage when conservative remedial measures would have sufficed.

A rather common error on part of the physician is failure to make a proper examination of patients complaining of urinary symptoms. Oftentimes the patient is questioned briefly, and then given some urinary antiseptic without so much as a urinalysis being made. While it is not expected that the average physician will become an expert in urologic diagnosis, yet he possesses the means for recognizing existing pathology, since these means consist of the five senses plus urinalysis.

PAIN: Pain is the commonest symptom of urogenital disease, but is unreliable from a diagnostic standpoint. Pain in one loin may be the only sensation experienced by the patient when the opposite kidney is diseased; and it is a notorious fact that a calculus in the ureter or kidney, which it would appear should give rise to most severe pain, often causes the least and in many cases is totally silent.

Can we obtain some clue from the nature of the pain? Usually dull pain over the kidney, or attacks of sharp pain in the loin radiating upward, or downward toward the external genitals, signifies disease of the urinary tract. The pain may be unilateral or bilateral, but no significance can be attached hereto. Pyelonephritis usually causes constant pain in the upper back, or it may resemble colic. Tenderness, on bimanual examination of the kidney, generally accompanies pain, and is a valuable finding. Brief notes of two cases illustrating the different character of pain are appended:

(1) A widow of 39, was referred for recurrent attacks of sharp pain in right loin radiating upward to the shoulder. She also had pyuria but there were no urinary disturbances. Complete urologic examination revealed a movable right kidney and a left pyelonephritis.

(2) A married woman, 46 years old, complained of recurrent attacks of intense colicky pain over the urinary bladder, aggravated during micturition; pollakiuria, and pyuria. Cystoscopy, ureteral catheterization and pyelography disclosed a left pyelonephritis, but no calculi.

Vesical pain is usually sharp, constant, and felt directly over the organ, or it may be referred to the urethra. The conditions commonly responsible for this type of pain are: acute cystitis, elusive vesical ulcer (submucous cystitis), and tuberculosis. Occasion-

ally pain is a symptom of vesical calculus, foreign body, or trigonitis. A mild form of pain described by the patient as "burning" on urination is often difficult of differentiation from that produced by posterior urethral lesions. Secondary cystitis of long duration results in diminution of vesical capacity and dysuria.

Deep perineal or prostatic pain is generally due to inflammation, since hypertrophy and neoplasm are not particularly sensitive except in the late stages. The pain of acute prostatitis is severe, lancinating, and there is the sensation of a "lump" in the rectum. Chronic prostatitis may be painless, but often there is an uneasy feeling, a sense of weight in the perineum, or a low backache. Prostatic pain is worse in the morning and becomes less during the day.

OBSTRUCTIVE PHENOMENA: DYSURIA: Painful or difficult urination is usually seen in cases of intravesical obstruction, or in lesions at the vesical neck. When acute inflammation or congestion supervenes upon chronic obstruction there may be urinary retention. There are three outstanding lesions in which retention may occur, namely: prostatic hypertrophy, acute prostatitis, and urethral stricture. Occasionally vesical calculus, pedunculated tumor, or cyst near the vesical neck, is the immediate cause of urinary retention.

UREMIA: The greatest effect of obstruction is upon the kidneys, producing impairment of function and nephritis which may lead to uremia. The symptoms of uremia are: thirst, headache, dizziness, drowsiness, coated tongue, foul breath, anorexia, vomiting, hypertension, polyuria and dyspnea. In elderly males suffering from Bright's disease or beginning uremia, look for prostatic obstruction as the cause.

HYDRONEPHROSIS: PYONEPHROSIS: These conditions are usually due to obstruction of the ureter, and may be diagnosed by the presence of a tumor-mass, pain and tenderness, fever, chills and pyuria.

HEMATURIA: Despite repeated warnings of urologists that hematuria is a symptom of grave import demanding investigation to determine its cause and source, physicians persist in minimizing this danger-signal by blindly undertaking treatment with urinary antiseptics. Inasmuch as the bleeding is often intermittent the patient is readily misled into believing it of trivial significance and much valuable time is wasted. In the absence of acute urethritis or local injury, blood in the urine is due to some organic lesion in the urogenital tract.

Kretschmer (4) in a clinical study of 933 cases of hematuria, found nearly 45 per cent

due to neoplasms involving the urinary tract; calculi ranked second with 18.5 per cent; and tuberculosis third with 11.75 per cent.

I believe the majority of physicians are now co-operating with urologists in the study and recognition of the causes of hematuria, with the result that more patients than heretofore are saved by early treatment.

Valuable information regarding the source of the hemorrhage may be obtained by a careful history and the three-glass-urine test. If the bleeding arises from the anterior urethra, the blood will flow intermittently and without regard to urination; if from the posterior urethra or prostate, the first glass will be discolored while the second will remain clear. Blood coming from above the vesical sphincter is recognized by its uniform admixture with the urine which has a smoky appearance.

PYURIA: Pus in the urine merely indicates the presence of infection somewhere in the urinary tract, or in close proximity thereto, the pus being discharged with the urine. Infection in the urogenital tract may be circumscribed or disseminated, involving otherwise normal tissues, or superimposed upon calculus, stricture, neoplasm or foreign body. The term "cystitis," used loosely for inflammation of the vesical interior, should be discarded as it is practically always a secondary rather than a primary manifestation. As more appropriate the term "pyocysturia" is suggested—meaning "the presence of pus in the bladder urine"—which would indicate an infective vesical, ureteral or renal process with discharge of pus in the urine.

Urethritis and prostatitis may give rise to pyuria, but these lesions are readily distinguished by local examination and the three-glass-urine test. Uniform clouding of the urine with pus suggests infection above the internal vesical sphincter, often pyelonephritis. Cystoscopy and ureteral catheterization must be employed to locate the cause and source of pus in the urinary system.

POLAKIURIA: Patients complaining of frequency of urination are often encountered by the physician, and these cases should always be studied in relation to other symptoms. Prostatitis and secondary infection of the vesical neck will lead to pollakiuria, dysuria and urgency in males. In young individuals having marked frequency, but no evidence of gonorrhea or prostatitis, renal tuberculosis should be suspected. In elderly men pollakiuria, especially at night, may be due to prostatic obstruction or chronic nephritis.

INCONTINENCE OF URINE: Loss of vesical control is a prominent finding in tabes dorsales, and sometimes in prostatic obstruction. Patients complaining of disturbances of urination should be given a neurologic examination

(pupils, reflexes, Wassermann test, etc.). About 50 per cent of tubercles have urinary symptoms some time during the course of the disease, and not infrequently they are the first signs to be noted. In prostatic hypertrophy some retention of urine is the rule, but later there may be incontinence due to overflow. Very often the cystoscope will be required to distinguish these lesions.

URETHRAL DISCHARGE: In the male urethral discharge may be due to acute or chronic urethritis, prostatitis, seminal vesiculitis (of gonorrheal or non-gonorrheal origin), urethral stricture, peri-urethral abscess, prostaticorrhea, or urogenital tuberculosis. The excretion in acute cases may be profuse and accompanied by signs of inflammation, while in chronic cases it is scanty and noticed only in the morning. Every urethral discharge should be examined microscopically after staining by the Gram method. Prostatitis following an uncured gonococcal infection is the commonest cause of chronic urethral discharge, but the excretion may be devoid of gonococci.

Neisserian infection in the female is woefully neglected by both the patient and the physician. Women so commonly complain of leucorrhea, or urinary symptoms, that when they acquire gonococcal infection it is apt to be mistaken for a cry of "wolf." Physicians are often remiss in hesitating to examine these women, many of whom they have known for years and have treated professionally for various ailments. Without specific examination, they usually conclude that the diagnosis of "leucorrhea" is correct and prescribe vaginal douches. Urethral infection is the commonest form in which gonorrhea occurs in the female and should be sought and treated when discovered. The occurrence of stricture of the female urethra is not unusual and is the cause of many obscure urinary complaints.

FOCAL INFECTION IN UROLOGY: The writer has been interested in this subject for a number of years, and in a previous communication (5) he stated: "Renal disease caused by remote focal sepsis occurs with great frequency and is manifested by a variety of pathological changes from a transient mild albuminuria seen in febrile diseases to complete destruction of the kidney by infection, calculi or tuberculosis." The chief lesions induced by remote foci of infection, such as infected teeth and tonsils, are: pyelonephritis, infected hydronephrosis, infection of residual urine, and prostatitis. Often a focus in the urogenital tract will act as a nidus for distant disease; for example, arthritis and endocarditis due to gonococcal infection of the prostate and seminal vesicles.

UROLOGY IN INFANCY AND CHILDHOOD:

Every physician who is called to treat a child with fever should remember the possibility of pyelitis as the cause. A specimen of urine should be obtained and examined microscopically. Local infections and gastroenteric disorders are often the forerunners of pyelitis in the young. Congenital malformations of the vesical neck and other types of obstruction are sometimes the basis of persistent pyelitis; hence, early cystoscopic examination should be advised in stubborn cases. With the perfection of the small cystoscope and ureteral catheters these little patients may be examined as readily as adults and with equal success.

PHYSICAL EXAMINATION: The examination of the urologic patient should be thorough; many errors in diagnosis are traceable to incomplete or careless investigations. While the local examination is the most important, a general routine investigation should not be neglected, otherwise pulmonary tuberculosis may be overlooked or circulatory lesions remain undiscovered. Disorders of the urogenitals tract are likely to be complex, mere signs of general disease or of other accompanying lesions. Nocturia may be a symptom of diabetes mellitus as well as prostatic hypertrophy. Hematuria may be a symptom of blood dyscrasia. That a patient has chronic prostatitis is no reason why he may not also harbor pyelonephritis. A urethral discharge does not always mean Neisserian infection; other diseases, such as syphilis or urinary tuberculosis, may be the cause. Doubtless many urologic patients who wander from one physician to the next, eventually reaching charlatans, are victims of careless, incomplete physical examinations. Keyes mentions the case of a man who had been treated many months for a mild gleet, while he was dying of chronic nephritis. The possibility of overlooking serious lesions should be borne in mind, and the way to guard against error is by painstaking study of the patient with every means at our command.

A complete examination of the urologic patient should include the following:

- (1). History.
- (2). Local examination.
- (3). General examination.
- (4). Urinalysis and smear examination.
- (5). Instrumental investigation.
- (6). Special laboratory and roentgen-ray examination.

A detailed and exhaustive history of both past and present complaints is of value in diagnosis, and it is well to question the patient regarding urinary disturbances that he may believe unimportant.

The local examination is begun by inspecting and palpating the renal and abdominal regions, the patient being first in the standing

and then in the recumbent position. The normal right kidney may be felt on deep inspiration. Any enlargements, tumors or fluctuant masses should be carefully sought. The renal and prevesical areas are percussed for enlargements and retentions. Tenderness and muscular spasm may be elicited in cases of infection. Kidney tumors or enlargements usually move with respiration.

The inguinal regions are then examined for herniae, glandular enlargements and erosions, and the external genitals studied for pathologic changes. Then the patient urinates in three clean glasses and the urine is reserved for analysis.

The rectal and anal regions are examined for hemorrhoids, fissures, etc. and for spinctheric tone. The prostate gland is palpated carefully, then the seminal vesicles are felt above and to the outside of the right and left prostatic margins. By massage prostatic excretion is obtained for examination. A catheter is then introduced into the vesical cavity to determine the amount, if any, of residual urine.

The minor instrumental examination is performed with the catheter, bougie a boule, steel sound and the urethroscope,—all with a definite object in view. Instruments should never be used in the presence of acute urethral infection or discharge, the reasons for which are obvious.

Urethroscopic and cystoscopic examinations, ureteral catheterization and urography belong to the domain of the urologist; and, in many cases, are indispensable in the proper care of the patient.

In general, every patient having pyuria not due to gonorrhea, every patient with hematuria, and for the diagnosis of suspected lesions of the vesical neck, the bladder, ureters and kidneys, should have the benefit of cystoscopy. The only absolute contraindications are: acute urethral infection, urethral obstruction, and great debility.

In obstructive lesions at the vesical neck, or prostatic obstruction, cystoscopic study is of great value in differentiation and for a decision upon the safest method of treatment. Of course, where the diagnosis is obvious and operation imperative, the cystoscope is superfluous; but every case is a problem of its own, no formulated rules being applicable to all.

SUMMARY

It is not the purpose of this paper to create the belief that I advocate indiscriminate urological examination of patients seen in general practice. Rather, it has been my endeavor to emphasize the importance of proper evaluation and interpretation of symptoms of the urologic patient, and to urge the physician to make as thorough an examination as circumstances will permit; in numerous in-

stances his deductions and conclusions will prove very valuable.

In closing a re-statement of some of the points made in the foregoing may be permitted:

(1) The symptoms of uropathology, being often vague and sometimes absent, one should be on the qui-vive for clues and question the patient carefully anent urinary disturbances.

(2) Pathology in the urinary tract having been discovered by the physician, it behooves him to exhaust every effort to determine the cause. Co-operation with the urologist will prove a blessing many times.

(3) Pain is a treacherous symptom in urinary disease, and while we must accord it undivided attention, we should keep other "cards up our sleeve" and not be led astray by sensations.

(4) In supravescical obstruction, i. e., ureteral or renal, hydronephrosis, pyonephrosis, nephritis and uremia occur early. In infravescical obstruction, i. e., prostatic obstruction, urethral stricture, etc., the early symptoms are pollakiuria, dysuria, and later nephritis and uremia.

(5) Hematuria is always due to some organic lesion in the genito-urinary tract, generally neoplasm. Therefore, early cystoscopic study to determine the cause and source is the duty of the physician.

(6) There is no such lesion as primary cystitis, and the term pyocysturia is coined to designate "pus coming from the bladder" but not having its primary origin from the vesical mucosa. This means that the primary lesion may be pyelonephritis, renal tuberculosis, tumor, calculus, foreign body, or what not.

(7) The paper has indicated what I consider a routine examination of the urologic patient by the general practitioner; if I were compelled to limit myself to two procedures, I would choose urinalysis including microscopic investigation and rectal examination with the finger. But the instrument that has revolutionized urology, and brought the light of day into the dim caverns of the urinary tract, is the modern cystoscope.

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DISCUSSION

E. R. Palmer, Louisville: It has certainly been a great pleasure to hear Dr. Cutler's paper. It was thorough and covered the urological field most completely.

I wish, first, to discuss it in a general way, and then emphasize some of the points that I think will bear calling attention to.

This society was certainly most fortunate in having heard last night the illuminating and timely address of Dr. Stewart Roberts, of Georgia, on "The Larger Diagnosis." Whereas this was addressed to and appealed to each and everyone of us, general practitioners, surgeons, internists, and all, it struck me, as a specialist, as being directed toward us more than any others. If there is any one criticism that is to be made upon the results of modern medical education today, it is that it is turning out helter skelter, what I consider in a way, half-baked, so-called specialists. I do not mean that these men are ignoramuses or anything like that, but they are men who have been trained to look not for personality, which Dr. Roberts stressed so much last night, but for bearers of disease. They are interested in this man more from his peculiar and interesting condition than as a personality suffering from something which they are to relieve.

The result of this is that it causes the modern specialist to gain the false idea that he is superior man in the practice of medicine, and he has a slight inclination to look down upon the general practitioner.

To my mind, there is no person in the world the equal of the old-time, regular general practitioner of medicine, the best examples of which are found today not in the large cities, but out in the highways and byways of our rural communities. I consider that the specialist is not his superior, but should be looked upon as a servant, the man who should know and recognize that, at the expense of a broad, general knowledge of medicine, he has acquired a certain experience and technic which he should be willing and glad to give to the aid of his more generally and more widely informed fellow practitioner.

I take it that our function as specialists is not simply to do this, not simply to give you the benefit of the expertness that we have acquired in certain mechanical manipulations, and so forth, but, in acquiring this expertness, to recognize that the man out in these rural communities can't be expected to have all of the complete armamentariums of all of the different lines and specialties, and that, therefore, with our knowledge that we have acquired through these means, we should try to get up as many simple ideas which we believe we can hand over to the general practitioner, which will aid him in determining and evaluating the various urological symptoms, or eye, ear, nose and throat symptoms, that will tell him when, and when not, the patient is one who should be sent to the specialist for expert treatment.

So much, then, in a general way. Getting back to the paper, the evaluation of symptoms and from these symptoms the determination or not

of whether it is a case that is fairly simple and can be handled by a more or less simple method, or whether it is one of grave import which should have really the expert attention that only one specially trained can give to it.

The cardinal urological symptoms, then are, first, pain, disturbances of micturition, blood and pus. We go then, I say, to the evaluation of these symptoms. It would hardly be necessary for me to say that when a man comes in complaining of frequent micturition, when we look at him and find the urine practically clear, nothing in it, by digging fairly deep into his habits, his constitution, and so forth, we find this is probably due to some indiscretion in diet; where there has been a concentration of the acid constituents of the urine that bring about this condition, a little purge, a little alkaline treatment and the symptoms subside.

L. T. Minish, Frankfort: Dr. Cutler has given us a very excellent paper on this subject. As a general practitioner for many years I have met with many urological problems. I believe that any general practitioner who sees as many as ten or twelve patients daily will see one to a half dozen of these cases every week. The last patient I examined on Tuesday morning before coming to this meeting, was one of that kind, and I had two others the day before.

I think Dr. Cutler struck a keynote when he said at the beginning of his paper that it is interesting to conjecture what we would do in the majority of our urological cases if we had no laboratory, no cystoscope, no renal function tests, no roentgen-ray or other appurtenances available to the general practitioner today. With these aids at our command I feel that we would be derelict in our duty to humanity if we did not find out or at least attempt to find out just what pathological condition we are dealing with in these cases.

There was some excuse in years past for our ignorance when we had only the history, the physical signs, and the chemical analysis of the urine to guide us. I know that I have been guilty of treating many cases of pyelitis, in the early years of my practice, especially in children, for acute malaria. Back in those days everything that began with a chill and had a temperature was treated for malaria.

It is now a routine practice for me to examine the urine of every patient, especially children, running a temperature without any apparent cause.

I think it is a Godsend that we have the urologist to whom we can send our more difficult cases. I am glad to know that the children now can have the same benefit of examination as the adults.

I was surprised to learn that urethral stricture is one of the commonest causes of pain in the abdominal cavity of the female. I was also surprised to know that out of ten thousand cases

reviewed by one man, forty per cent operated on for appendicitis were not relieved of the symptoms of the disease from which they suffered. However, I think it is better to operate on these cases when in doubt, rather than to let a pus appendix get away.

Dr. Cutler tells us that he does not expect the general practitioner to become expert in urological diagnosis, yet we possess the five senses plus urinalysis which will help us out in most of our cases. The symptom of pain is so deceptive, yet it is one that we have to take largely into consideration in making a diagnosis.

The cause of these troubles other than Neisserian infection, in my judgment come mostly from focal infection, teeth, tonsils, abdominal cavity, and so forth.

Jethra Hancock, Louisville: It would seem to do violence to a paper of this type to undertake to discuss it in three minutes, but there is just one phase I shall undertake to touch on, that is the urinary disturbance in the female. This is of extreme importance. It may be a very simple affair, such as simple urethritis or gonorrheal urethritis, yet it may be the beginning of a very grave condition such as tuberculosis of the kidney, which will cost the patient her life unless it is readily recognized and given appropriate treatment.

We can see that it takes the expert to evaluate this kidney condition, yet the general practitioner should be familiar with the cardinal symptoms and always in position to work in close co-operation with the expert urologist. He should know that there is no such thing as idiopathic hematuria. He should know that when blood is found in the urine that it may be a very simple thing as a bleeding caruncle or trigonitis and should be in position to readily recognize these conditions and give appropriate treatment. If the cause of the bleeding or other urinary disturbances is not at once diagnosed by the general practitioner, the patient should be referred to a urologist for a careful examination of the urogenital tract which contemplates a thorough examination by the cystoscope, ureteral catheterization, differential function test to ascertain whether the disturbance is from the right or left kidney.

We can readily see that this examination should necessarily be referred to the expert, but there is no reason that the general practitioner may not be familiar with some of the more simple procedures. I believe the general practitioner could easily learn to know that a simple caruncle is causing the disturbance and remove it himself. Thus, giving the patient almost immediate relief from a very painful condition.

There should be the closest co-operation between the urological surgeon and the general practitioner that these patients may not be permitted to advance to a condition that makes the outlook very grave, whereas it might be detected earlier.

I truly have enjoyed Dr. Cutler's paper and

hope it receives early publication in the Journal because it covers a wide field of great importance to the patient. The general practitioner can see from this paper that he can work in conjunction with the specialist which co-operation will lead us more quickly to better medicines and better surgery.

Irwin H. Cutler, (in closing): I was indeed glad to hear the discussion from the specialist's viewpoint, and especially that of the general practitioner's opinions.

I tried in this paper to present the symptoms and physical signs of urogenital disorders in a simple manner so that the doctor in every day practice can recognize them. Then, when once discovered, he can decide which cases can be treated in his office and when it is essential to secure more complete urological examination.

Dr. Minish has emphasized many statements that are important. The modern general practitioner in handling urogenital disease does not stop with writing a prescription for a urinary antiseptic, advising, "There is nothing the matter; it will soon go away." Any disturbance of urination, pyuria, or hematuria that the patient presents is generally a serious matter, for the reason that as a rule he does not consult the doctor nor the specialist until the disease is in an advanced stage. For various reasons patients suffering from urinary disorder do not consult physicians as early as they should. When you do see a case of that kind, you must realize that the disease is probably advanced.

A CASE OF ACUTE RHEUMATIC FEVER*

By SAN A. OVERSTREET, M. D., Louisville.

I have considered this case worthy of mention because of three factors:

1. Differential diagnosis.
2. Effect of salicylate medication on the kidneys.
3. Response of hypertension to treatment.

The patient, a red-headed woman of 30, came March 13th. to the office complaining of a severe aching of body and extremities of three or four days duration, fever and sore throat. She had a very red, velvety sore throat and enlargement of cervical glands along with a temperature of 101° F. and pulse of 100. She was accompanied by her ten year old son, who had the same complaint and physical findings except for a more definite involvement of the tonsils. Diagnosis of septic sore throat was made and rest in bed and usual treatment advised. During the next three days the course of both was satisfactory and the woman did not longer remain in bed. Throat culture showed streptococci and staphylococci in usual proportions.

March 21st. I saw her at home with temperature 103° F. complaining of severe pain

*Read before the Jefferson County Medical Society.

in chest and all joints. There were a few red spots over the skin slightly painful to pressure and from 1 to 3 cm. in diameter. Made provisional diagnosis of early pneumonia with rheumatic pains and nodules. The cervical glands were very large and hard. Two days later rheumatic pains were worse, wrists and elbows were swollen and tender but especially were the ankles involved and swollen. She was sweating profusely. The cutaneous spots first noticed had increased in number over arms and legs, were elevated, red, tender and appeared in the nature of subcutaneous nodules. Diagnosis was made of acute rheumatic fever and sodium salicylate prescribed 15 grains every two hours giving 150 grains daily. The chest cleared slowly.

Response to this medication was satisfactory. Dr. Horine was called in consultation and confirmed diagnosis of rheumatic fever upon two visits. The temperature varied from 100° to 103° F. for four weeks and she was allowed up only after temperature had been normal or below 99.6° F. for one week. The subcutaneous nodules, however, became a very troublesome factor numbering at one time approximately 200 scattered over extremities with an occasional one on chest. They varied in size from 1 to 4 cm. in diameter, were elevated and hard, red, hot and exceedingly tender at first, and each day half a dozen or more new ones would appear. After remaining red and tense for about one week with sometimes the appearance of being about to suppurate, they would subside leaving hard bluish nodules not tender and within four weeks would completely disappear except for small area of discoloration. These nodules I assumed to be rheumatic in origin, but upon later study wonder if they might have been an erythema nodosum, since they did not have the characters of ordinary rheumatic origin.

It was three days after the institution of the massive doses of salicylates that I made the first urinalysis and found a heavy reaction for albumin, an abundance of erythrocytes and many hyalin and granular casts. An urinalysis was made daily for the next three weeks. The dosage of salicylates was lessened or withheld two or three times during this period due to the toxic symptoms shown by the patient. The albumin showed little variation but the erythrocytes and casts appeared greatly increased on the days during which she had the massive doses and greatly diminished with the lessening of the dose or withdrawal of the drug. During convalescence, when 30 to 50 grains of salicylate were given daily, the blood cells and casts practically disappeared from the urine and albumin was reduced to a heavy trace. There was considerable swelling of the legs as high

as the knees during the first two weeks for which the joint condition was probably more accountable than the nephritis.

P. J. Hanzlick in one issue of "Medicine" gave an exhaustive review of the pharmacology of salicylate and concluded after experimentation that in large doses it produces nephritis with albuminuria and decreased function in man and animals. This may result in edema, diminished diuresis and phenol-sulphonephthalein output, increase of albumin and nitrogen products. The effect is not influenced by sodium bicarbonate intake. Pathology has been reported in glomeruli and throughout the tubules.

A third feature of interest was an elevated blood pressure (170-105) when first taken and continuing at this point or higher throughout convalescence, reaching 200-105 on one occasion after she was up and about. This continued for about two months after she was up and about. She described symptoms indicating the probability of a vascular disturbance (hypertension) for a year or more before the present illness. Independent of the rheumatic fever, and because she complained of very scanty menstruation for a long time, I prescribed ovarian tablets with Corpus Luteum tablets just preceding and during menstruation. There was some relief from the menstrual dysfunction during the first period and pressure following this therapy, and the blood pressure on two different visits, was 150-90.

It was after long persuasion that she was convinced a dental examination was necessary, and four abscessed teeth were removed, not, however, until the reduction in blood pressure had occurred. She promises to have her tonsils removed in the near future. I have been able to find no other focus of infection.

DISCUSSION

Virgil E. Simpson: That peculiar group of clinical manifestations designated as rheumatism, or rheumatic fever, monarticular rheumatism, acute or chronic polyarticular rheumatism, has shown as varied and perhaps as interesting an evolution in the past twenty years as any other disease we have had to reckon with. Twenty years ago rheumatism was frequently diagnosed clinically. There were three types recognized at that time, namely, muscular rheumatism, the monarticular type of rheumatism in which usually a single large joint was involved and the multi-articular or polyarticular type which was very prone to become chronic in its manifestations. We thought then that we had the question of rheumatism definitely settled and began to devote our attention to other and perhaps more interesting topics. Then Frank Billings came along with some other observers and discredited all our preconceived and previously

adopted views and caused us to doubt seriously whether there was any such thing as rheumatism. We then came to look on all these muscular and articular types of involvement as more or less local expressions of what Billings called "focal infection." And perhaps nobody regretted the introduction of this expression any more than Billings himself, because he came to realize as he observed the tremendous enthusiasm attending the acceptance of this new idea of focal infection, how many useful teeth were being sacrificed and how many healthy tonsils were likewise being removed. Then latterly, after having almost put into the discard our pre-conceived notions of rheumatism and espoused the cause of focal infection, we are now coming back to the beginning and discussing rheumatic fever; so Dr. Overstreet in his report is entirely orthodox in recognizing his case as one of rheumatic fever.

This latter evolutionary step in connection with rheumatism or rheumatic fever is partly the result of the action of the American Heart Association in its classification of the causes of heart disease. The Heart Association has insisted on the setting down not only the cause of heart disease, the etiological agent, but also the physiological disturbances which the diseased heart is manifesting as well as the anatomical or pathological changes present. In other words, they want us now to classify the cause of the disease, if we have acute or chronic endocarditis, pericarditis or what not, if valvular disease exists the particular valve or valves involved, and in addition they want us to go further and specify the functional disturbances the heart is manifesting according to the classification which they deem proper. The statement that 40 per cent of cases of heart disease owes its origin to acute rheumatic fever is one, perhaps, those of us in this part of the country are not quite ready to accept, nor do we believe that rheumatic fever is responsible for as many heart diseases as are being reported at present. There are certain sections of the country where that may be true due perhaps to the influence of climatic conditions, for instance in the New England States where much of the statistics originate. I see relatively few cases of what I have called acute rheumatic fever in this community, yet anyone spending a short period in New England, is obliged to realize that there is a clinical condition there which behaves in a manner different from the clinical conditions we see here in Kentucky and in the Southern states.

Additional interest in the question of rheumatic fever has been invoked by the laboratory studies in its bacteriology. The work of Small, the preliminary report of which was published in the American Journal of Medical Sciences, February, 1927, aroused considerable interest. There still remains, however, some difference of

opinion among the laboratory workers as to the absolute identity of the organism which he isolated. He undertook to develop a specific serum for the treatment of rheumatic fever and has modified it from time to time as his observation and experiences warranted. There is, I think, less unanimity of opinion as to the value of the serum than there is in the identity of the streptococcus which he thinks causes the disease. The streptococcus family is composed of many varieties and has caused us considerable vexation in establishing the identity of strains thought to be the cause of scarlet fever as well as rheumatic fever.

The question might be asked, what kind of a heart lesion is present in these particular cases, which leads to the general proposition of what kind of heart lesions may be expected in rheumatic fever. The mitral valve is the one usually involved in acute rheumatic fever; and the type of mitral valve involvement commonly seen in acute rheumatic fever is the stenotic rather than the regurgitant type. It is probable that the majority of physicians see and diagnose several cases of mitral regurgitation to one case of stenosis. The reason for this is two-fold: first, in this section stenosis is not as common as in other parts of the country, second, in my opinion slight cases of mitral stenosis are overlooked or are diagnosed as mitral regurgitation. It requires a rather fine discrimination to decide one-tenth of a second difference in sound time. If there is a diastolic murmur occurring just before systole of the heart, it requires considerable pains and training to distinguish as to what time it occurs. Of course, where one studies a heart presenting that sort of picture and has the advantage of electro-phonoc tracings, examining first the patient and then the tracing, after a while he can recognize one-tenth second difference in the sound and differentiate between early and late diastolic murmurs. But even then it requires a good ear and long training. That is the type of mitral lesion usually found in rheumatic fever.

I think Dr. Overstreet was correct in questioning his original conception that the nodules present in his case were rheumatic in origin. Typical rheumatic nodules, those that occur in rheumatic fever, do not develop with marked rapidity, discoloration is not a characteristic feature, and their appearance along the muscle tendons establishes them as irritative lesions. In this case I rather question the rheumatic origin of the nodules. There is a group of so-called nodules occurring in individuals, classified and referred to as *peliosis rheumatica*, and other names which do not mean a great deal to the majority of us, perhaps due to disturbance of the circulation, whether localized infections in the capillaries or obstruction of the arterioles with rapid formation of nodules from the re-

action which takes place, seems uncertain.

There is probably no drug so far as we know today that has any more satisfactory influence on what is now recognized as acute rheumatic fever, than has salicylic acid. To secure the proper effect the drug must be administered in large doses. When given in this way we not only get the beneficial effect so far as relief of the existing rheumatic fever is concerned, but it is believed by those having the largest experience with this type of lesions of the heart that the salicylates have some influence in preventing these valvular lesions. If the drug is given by mouth in large doses it will almost always produce gastro-intestinal disturbance, and it has been suggested may also produce some disturbance of the kidney. Where gastro-intestinal disturbance is manifest, it is very easy to obviate that difficulty by administering the drug per rectum. The dose decided upon, whether it be 40, 60 or more grains, is dissolved in warm sterile water and introduced into the rectum. It is always wise to give beforehand a cleansing enema. I generally use saline or soda solution as a cleansing enema, then introduce the sterile water containing the salicylate with starch water and have the patient retain it. One dose daily is sufficient.

Sam A. Oversleet, (in closing): Dr. McCormack asked whether there was any cardiac involvement. We could detect none. The hypertension probably had nothing to do with the present attack of illness. The patient had symptoms which pointed to hypertension some months before.

NEWS ITEMS

The New Highland Sanitarium and Clinic wish to announce the opening of their new fire-proof building on February 16th, 1929, completing the largest and most complete Clinic in Indiana and offering to the Medical Profession a service to their cases not obtainable in a general hospital or home.

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By **SIMON P. SCHERER, M. D.**,
President and Medical Director.

Dr. Will R. Pryor, former House Surgeon of the Brooklyn Eye and Ear Infirmary, who has just returned from a year in Vienna, is now associated with Dr. Gaylord C. Hall at 705 Brown building.

Dr. R. C. Pearlman, announces the removal of his offices to the Uptown Theatre building, 1508 Bardstown Road, Corner Eastern Parkway. Most of time devoted to his Specialties, Surgery, Diseases of Women and Obstetrics. Hours. 11-12 4-6, 7-8 p. m., Louisville, Kentucky.

WOMAN'S AUXILIARY NOTES

ANNUAL MEETINGS

Several of the County Auxiliaries hold their annual meetings with the election of officers in March. Others are changing the date for their annual meeting to the month of March, or April, as this has been found advantageous to the organization. New officers begin their term of office at the close of the May meeting. This time, from the election in March to installation in May, gives the new officers an opportunity to learn all about their work before taking over responsibilities from the out-going officers. Also, another advantage of spring annual meetings, is that the new officers have the summer vacation period in which to prepare a program and make plans for the year's work which usually begins in September.

THE STUDY COURSE

As this goes to press, the first two lessons in the Study Course in the Medical and Health Laws of the State and Nation have been sent to the members of the Auxiliary.

Each week, another lesson will follow. These lessons, brief and easy to read, are in the form of questions and answers. References for the State Laws, giving more detailed information to be found in "The Public Health Manual" or in "Carroll's Statutes" are, also, given.

The information concerning the United States Public Health Service is obtained from "Public Health Reports" of the United States Treasury Department and from the "Congressional Directory" of the Seventieth Congress.

This study course is an attempt to comply with the suggestion of the President of the American Medical Association, April 22nd, 1926. On that day at the annual meeting of our National body, the Woman's Auxiliary to the American Medical Association, Dr. Wendall Phillips, the newly installed President of the American Medical Association, made a stirring address in which he suggested that the members of the Auxiliary study, thoughtfully, the medical and health laws of their own state and nation.

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Are you going with your husband to the 1929 Annual Meeting of the American Medical Association in Portland, Oregon, July 8th to 12th?

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COUNTY SOCIETY REPORTS

Whitley: The meeting of the Whitley County Medical Society was held at Williamsburg, Dec. 11th, with the following doctors present: Garfield Howard, J. D. Adkins, P. G. Petrey, L. B. Croley, and E. S. Moss.

The following officers were elected:

President—L. B. Croley.

Vice-President—J. D. Adkins.

Secretary—C. A. Moss.

Board of Censors: Garfield Howard, E. B. Stonesifer and P. G. Petrey.

Delegate—L. B. Croley.

Alternate—C. A. Moss.

C. A. MOSS, Secretary.

Harrison: The Harrison County Medical Society held the annual meeting at Cynthiana, December 3rd, 1928. Visitors and members present: G. S. Hanes and A. T. McCormack, of Louisville; C. W. Shaw, Brown and Blades, Alexandria; Daugherty Uesery, Orr and Sterne, Paris; H. C. Clark, Falmouth, Caldwell, Newport; Drs. Wyles, Carr, McDowell, Wells, N. W. Moore, Chamberlain, Woods, Rus, McIlvain, Henry, Martin, W. B. Moore, Fail and Green.

Dr. Wyles called the meeting to order for election of officers for 1929, which resulted in the election of R. W. Wood, president; N. W. Moore, vice-president; W. B. Moore, secretary-treasurer, and W. B. Carr, censor; W. B. Moore, delegate.

After the election of officers, informal talks were made by G. S. Hanes, A. T. McCormack, C. W. Shaw, C. G. Daugherty and H. C. Clark.

Meeting adjourned for dinner at Rnald's Coffee Shoppe. This society held twelve meetings during the year. We have every reason to believe interest will continue during the coming year.

W. B. MOORE, Secretary.

Union: Minutes of the Union County Medical Society, November 27th, 1928.

The following were present: Dr. Carr, Dr. Stewart, Dr. Graves, Dr. Sloan, Dr. Martin, Dr. McKeehan, Dr. Donan, Dr. Lynn, Dr. Allen, Dr. Winston, Dr. Wynn, Dr. Gray. Out-of-town physicians were: Dr. Woods, Dr. Caldwell, Dr. Wishart, Dr. Logan, and Dr. Acor, of Evansville, Indiana.

The following officers were elected for the ensuing year:

President—H. B. Stewart.

Vice-President—D. M. Sloan.

Secretary—David C. Donan.

Delegate—H. B. Allen.

Alternate—I. D. Winston.

A supper was given after which a scientific session was held in the directors' room of the Morganfield National Bank. The subjects discussed were diabetes and pernicious anemia.

DAVID C. DONA, Secretary.



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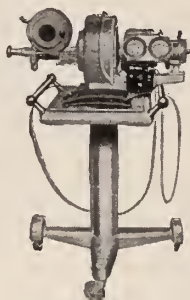
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EDITORIAL

THE CONFERENCE OF CITY AND COUNTY HEALTH OFFICERS

The School for the County and City Health Officers has just completed a week's session, and this is the first time that the county health officers conducted the programme. Kentucky now has forty all-time health departments geographically representing every section of the state. Each speaker added a new interest to our Health Officers Conference, because he had a different problem to present.

Dr. Albert Stewart, of Scott County, gave a most instructive address on new methods of controlling tuberculosis cases that are not able to have sanatorium care. He is utilizing a portable cottage which can be erected on the side of the home, and with the co-operation of the physician, health officer and nurse, these patients are receiving full and adequate treatment. A tuberculosis sanatorium should be an institute for training tuberculosis patients to take care of themselves and to so regulate their lives that they are not a menace to their immediate family, and this educational idea is being carried out in Dr. Stewart's cottage plan.

Dr. W. W. Cort, of the Johns Hopkins School of Hygiene and Public Health, gave a most interesting talk on Ascariasis, which will create a renewed interest in parasite infestation. He demonstrated that the presence of *Ascaris* is an index to the sanitation of the home and community and this disease is spread by the run-about child usually because convenient toilet facilities have not been arranged even in our well regulated rural homes for its accommodation. Dr. Cort is now making an intensive study of this problem in Tennessee, and will be in Kentucky next year.

The American Public Health Association has secured a popular speaker for the Chautauqua Circuit to lecture on public health, and we ask the physicians for those counties where this entertainment appears to give this speaker their hearty co-operation.

WHAS of the COURIER-JOURNAL and LOUISVILLE TIMES requested one of our well beloved county health officers, T. A. Frazer, Crittenden county, to give a talk on wild life. A private radio was installed in the

State Board of Health, and an appreciative audience listened to his imitation of birds.

An afternoon programme was given by Dr. J. F. Owen, Director of the Bureau of Dental Health. This department has prepared numerous charts for exhibition, which are now available to health officers and physicians. Dr. Owen emphasized the value of fresh vegetables, especially when eaten raw in salads, plenty of fresh fruit, such as oranges and apples, whole wheat bread, and hard, chewy foods, for the development of good teeth. Teeth must be fed, nourished, and exercised just the same as any other part of the body.

OUR ANNUAL MEETING

The date of our annual meeting has been definitely settled for Monday, October 21st, through Thursday, October 24th, and will be held in the auditorium of the roof garden of the beautiful Brown Hotel. The registration booth, commercial exhibits, and lounging room will be on the same floor. This place was selected so that it would be far above the city noises. Arrangements are being made to have group lunches served so that members can enjoy meeting their friends during this social hour. Dr. Charles Mayo, of Rochester, Minn., will be the principal speaker in a public address to be given on Wednesday evening. The commercial exhibit this year will prove of exceptional interest and educational value, and the entire space will soon be sold. The Program Committee is endeavoring to make this meeting of special interest to every doctor in the state. Symposiums are being arranged on Influenza, Diabetes, Scarlet Fever, and other subjects which will be announced later. There will be plenty of opportunities for recreation and for observation of clinics, so that pleasure and work may be combined. The four golf courses of Louisville will be open to the physicians, the Brown theatre has a stock company that will be playing all during that week, and the Women's Auxiliary is planning most elaborate entertainments for the wives and daughters of the physicians. This seventy-ninth annual meeting of the Kentucky Medical Association, with the help of every doctor in the state, can be made a real revival of learning.

THE LABORATORY SCHOOL

On May 18th the School of Public Health of the State Board of Health will graduate seventy young men and women from their School for Laboratory Technicians. More than one-half the class already have positions waiting for them, and every day brings requests from almost every section in the union for these graduates. Among our pupils are many doctors' daughters, and other relatives, and they share with us the pride that we have in equipping these students to carry on the work of preventive medicine.

The remarkable development of medical science during the past thirty years to a large extent can be credited to the laboratory. Prevention and control of disease are built around the laboratory. The prompt and accurate diagnosis of communicable diseases depends upon the access of a good laboratory. The pursuit of science is only a pleasure to those of specially trained mind. To be of service to humanity it must receive wide dissemination, and every physician should have within easy access a well-trained laboratory technician so that he can give to his patients and to his community all the latest developments along the line of preventive medicine.

We have endeavored through our School of Laboratory Technicians to make available to physicians, clinics, and hospitals, adequately trained technicians. Every hospital, regardless of its financial condition, will be able to meet the requirements of the College of Surgeons by employing one of our qualified technicians. If there is not sufficient laboratory work to keep them busy they can assist in taking histories, keeping hospital records, charting operative procedures, developing of x-ray films, and preparing and staining of tissues for the pathologist. In doctor's offices they can assist in the preparation of patients in taking histories, and keeping records—in fact, act as a general office assistant.

The fame of this school has reached even our foreign countries. We now have graduates from Shanghai, China; Cape Town, South Africa; and La Ceiba, Honduras, Central America. The success of our school is due to the hearty co-operation of the physicians of Kentucky.

The following outline covers the course of instruction. The procedure used in each subject has been compiled in book form and is available to any physician at cost. This manual will assist the busy practitioner in interpreting laboratory results, and by using it as a reference he can assist his technician in all the newer laboratory tests:

Preparation of Culture Media.

Stomach Analysis, Stomach Lavage.

Blood Analysis which consists of Widal, Malaria, Blood Culture.

Blood Counts.

Blood Chemistry.

Blood Grouping and Matching.

Urine Analysis.

Milk and Water Analysis, including Human milk.

Tuberculosis, examination of sputum and urine.

Diphtheria, including Schick Test and Virulence Test.

Intestinal Parasites, including Hookworm.

Dick Test for Scarlet Fever.

Throat and Nose for Hemolytic Streptococcus.

Typing Pneumococcus.

Renal Function Test.

Van Den-Bergh Test.

Icteric Index.

Typhoid group, Differentiation, Typhoid Carrier.

Blood Culture for Typhoid Bacillus.

Rabies, Examination of brain, and administering Pasteur Treatment.

Meningococcus.

Spinal fluid Analysis.

Gonococcus.

Preparation of autogenous, and Typhoid Vaccine and Influenza—Pneumonia Vaccine according to the formula of Rosenow of Mayo Clinics.

Complement Fixation Test for Syphilis.

Colloidal Gold Test.

Kahn Test.

Tissue Preparation and staining Paraffin, Celloidin and frozen sections.

Carbon Dioxide capacity of Blood Plasma.

Preparation of Acidophilus Milk.

Bacteriophage.

Basal Metabolism.

THE POST GRADUATE COURSE

The Council of the State Medical Association which held a meeting recently in Louisville has heartily endorsed the Post Graduate Course, which will be held in Louisville, July 8th to 20th, inclusive. The course of lectures presented last year was so acceptable and helpful, that the same general arrangement will be pursued this year. However, there will be some difference in the lectures and the subjects to be discussed, so it will not be a duplicate of last year's work. We are planning to give more bedside conferences in small groups for those interested in intimate clinical work.

The Louisville Baseball Club will be in the city most of the time, so if there is too much brain fatigue, there will be an opportunity for relaxation. Golf devotees can also arrange for a little much needed recreation.

Arrangements will be made for Hotels and Boarding Houses convenient to the School and expenses need not be more than moderate.

OFFICIAL ANNOUNCEMENTS

PROGRAM OF THE EYE, EAR, NOSE
AND THROAT SECTION OF THE
KENTUCKY STATE MEDICAL
ASSOCIATION

The Eye- Ear, Nose, and Throat Section of the Kentucky State Medical Association will meet in Lexington, the evening of May 22nd. Dr. J. D. Williams, of Ashland, Ky., will be toastmaster at the dinner at seven o'clock at the Lafayette Hotel and Dr. Meyer Wiener, of St. Louis, will be the guest of honor. Dr. Williams has not given us the subject of his president's address. Dr. Wiener is a distinguished ophthalmologist and the society is fortunate in securing him. It is expected that about seventy-five members and their guests will attend the dinner. The business session will meet at nine o'clock the following morning and it is hoped that the scientific programme will be concluded at three p. m., so that the members may indulge in Blue-grass scenery, golf, etc., for the remainder of the day.

Papers will be read by:

Drs. Claude Trapp and W. A. Poole, of Lexington.

Dr. G. W. White, of Henderson.

Dr. H. G. Reynolds, of Paducah.

Dr. T. L. Bailey, of Madisonville.

Drs. Frank Pirkey, Octavus Dulaney, and Chas. K. Beck, of Louisville.

WALTER DEAN, Secretary.

Ozone Fallacy in Garage Ventilation.—According to Salls, the ozone generators that have been installed in a number of commercial garages and service stations do not convert carbon monoxide into carbon dioxide at a rate that is fast enough, or in proportion that is complete enough, to be of any practical use for the removal of carbon monoxide gas from the atmosphere. It is far better and more effective to open a few windows and permit the removal of the carbon monoxide by the process of natural diffusion; or, if a Sayers-Yant test is positive, to install mechanical ventilation. A suggestion has been made that ozone may be useful in the treatment of carbon monoxide poisoning, but its value for this purpose has not yet been proved; and it is not recommended that a gas considerably more poisonous than carbon monoxide be used to obtain a problematic physiologic advantage, when the installation of better ventilation is a safe and sure remedy. Experiments on known concentrations of carbon monoxide in a small room in which an ozonator was in operation while air samples were withdrawn at regular intervals for analysis by the Sayers-Yant method did not show any evidence of an appreciable action of the ozone on the carbon monoxide.

ORIGINAL ARTICLES

TREATMENT OF TYPHOID FEVER*

By T. T. GIBSON, M. D., Middlesboro.

In presenting this subject our aim is to give due credit where new ideas have been advanced, especially those that have come to our attention. There are others, no doubt, of which I am unaware. It is only when we glance backward in this way that we become fully conscious of the magnitude of life's changes. Let us go back many hundreds of years, to the days of the "Ghost House" (and it is claimed by some that it still exists on some of the South Sea Islands), which is the residence of the tribe's Medicine Man; where the architecture was designed to frighten away evil spirits. Also, to the witch doctor (which probably still exists in parts of Africa) who performed his acrobatic stunts, and wore a costume designed to frighten away whooping cough, or heal a fracture. Then let us advance a little further to the herb doctor who guaranteed to heal practically all the ills of the body with his few herbs.

Typhoid, although known through all these ages, even beyond the reach of tradition, remained for Gerhard, of Philadelphia, to discriminate Typhoid from Typhus Fever, early in the nineteenth century, and later his findings were corroborated by many others, but not until the decade of 1840 to 1850 that witnessed the overthrow or erroneous notions concerning the similarity of Typhoid and Typhus Fever.

The method of preventing the spread of Typhoid Fever did not become generally known until it had killed so many soldiers during the Spanish-American War. After this came sanitation, then inoculation, and where these methods of prevention prevail Typhoid is practically unknown, and this accounts for the fact that the city doctors rarely ever see a case of Typhoid Fever, but the doctors doing a rural practice, see many cases almost every season, because the public in general in rural districts do not practice sanitation and inoculation.

There is at the present day general agreement among Medical Authors that the best mode of treating Typhoid Fever, is by means of the cold bath, which was originally introduced by Currie, of London, (more than a century ago) and later re-introduced and practiced by Brand, of Stetten. Among the many influences of the cold bath as given by Brand, they absorb the body-heat, directly, thus reducing the temperature. This has been the mode of treating Typhoid for more than a century, although it did not become

*Read before the Kentucky State Medical Association at Richmond, Sept. 10-13, 1928.

general until the last half century, and because of the apparent comfort it afforded the patient we were led to believe it to be the best treatment, at least it did give us something to do that added comfort to the patient, but that idea was of more than one hundred years ago, and at that time it was the best to be had, but since that day engineers, chemists and physicists have developed many new ideas. Therefore, our idea of Pathology must be altered to conform with results obtainable with the newer methods which we now have at hand. It is because of these new developments that I wish to introduce a new idea which for five years has proven much better, in my experience, than the century old method of treating Typhoid Fever, and I wish to pass it on to others that they may benefit from its value until something better is found out, or until the disease is entirely eradicated by sanitation and inoculation.

Of all the many different germs, only a small per cent of them infect the human body. Why? It is because each different kind or species of germ can survive and thrive in certain temperature. For example:—the human does not have chicken cholera, because the *Pasteurella-Avisseptica* cannot thrive and multiply in the temperature of the human body, from which we can see that the germs which can thrive and multiply in the temperature of the human body are on their Happy Hunting Ground when they gain entrance to their adaptable soil. The Typhoid Bacillus, by reason of its nature, happens to be one of these which thrive and multiply rapidly at the normal temperature of the human body. It was shown by Prudden, many years ago, that you can freeze the Bacillus into quiescence, then thaw him, and he resumes activity; but boil him, and you pass him on to the Great Beyond from whose borne no traveler has ever returned, so then, while we sit and think, let us not just sit, but let us also think if the Typhoid Bacillus thrives and multiplies well in the normal temperature of the human body, and if you cannot freeze him unto death, but can boil him to death, is it not reasonable to see that nature in its wonderful mechanism, is making an effort to kill out the infection, by using the poison produced by the toxine, from the handy work of the Bacillus, to raise the temperature of the patient infected with Typhoid, so as to get the temperature high enough, and for a long enough time so that the Bacillus cannot multiply and replenish itself further in the high temperature: thus establishing a self limited disease the cycle of which it takes nature, when undisturbed, twenty-one days to complete. Then because of this Pathological heat extended over such a long period of time, the patient becomes so emaciated and exhausted it takes many weeks

to recuperate from this ordeal. While we are striving to keep our patient comfortable by keeping the temperature lowered with cold water, we are, at the same time, working against nature by keeping the temperature of the body nearer where the Bacillus can thrive and multiply, thereby, lengthening the time of the self limited disease, and because of our interference with nature's plan, the patient's sickness is prolonged into many months, and beset with many serious complications, which often cause death. However, many of them finally recover, not because of the cold baths, but in spite of them. With this explanation of the century old mode of treatment, and of nature's plan to rid the body of the infection, how can we best help the patient? Is it by working with or against nature? Is it not reasonable to say that it can be done best by assisting nature? Assuming that we are of one mind, in the opinion that to assist nature, is the best policy, then by what method can we best accomplish this? It is evident that to add physiological heat to the patient, which does not kill the Bacillus, but does prohibit its multiplication, will assist nature's plan much better than to add cold, or else nature would lower rather than raise the temperature, for cold keeps the temperature within range of where the Bacillus can multiply rapidly, while physiological heat keeps it where they cannot, and at the same time while we are prohibiting their multiplication with physiological heat, we are also opening up avenues for a rapid on-rush of Leucocytes, with the function of which we are familiar.

Then, if we use heat with which to assist nature, how are we to get physiological heat within the body with which to reach the deeper structures? There are many ways of producing heat, some of which are non-luminous—hot water, hot vapor, hot air, hot water bags, etc., which do not penetrate deeper than the skin, The Radiant heat, Electric Arc, incandescent filament or heating element, acts at a distance, producing heat beneath the skin. While in the high frequency bipolar current known as Medical Diathermy, we have not another agent, but simply another method of applying electro-magnetic energy by means of an electrical current with a frequency so high that it fails to produce neuro-muscular response, but instead, its energy is transformed into cellular heat in such a manner as to raise the physiological temperature of deeper tissues higher than by any other method yet devised, when properly turned through the tissues. The heating effect is due to the resistance of the tissues to the rapid passage of the current, and is proportional to the electrical energy dissipated in the tissues, and when used to heat tissues within their physiological limits is termed "Medical Diathermy,"

distinguishing it from "Surgical Diathermy," when used to heat tissues beyond their physiological limits, producing actual tissue destruction either by dehydration or coagulation. The exact path of the Medical Diathermy current is not definitely known. It may be surmised that the current will follow the paths of least resistance and shortest distance. An important consideration, is, therefore, to so place the electrodes that the shortest path for the current will be through, rather than around the part, when using the so-called through and through method. Therefore, if we place a large electrode, according to the size of the patient, one on the back and one on the abdomen, and if complications are already present, place the electrode opposite each other, on each side of the seat of the complications, in this way producing more physiological heat at the seat of the infection, and because of the circulation of the blood, a portion of this physiological heat is absorbed and carried to all parts of the body. By this method of producing heat within the body, we can, without any bad effect, whatever, on the tissues, produce enough physiological heat within the body to invite rapid chemical changes, increasing the Metabolic rate, and raise the physiological temperature of the deep tissues to a higher degree than the Bacillus can multiply in, thus lowering the Pathological temperature of the patient much more quickly, by assisting nature to prohibit their multiplications, and in this way killing out the infection on an average, within ten days.

For the benefit of those fearing hemorrhage with this method, in brief, start your Diathermy treatments early and often, and your patient is well before he reaches the stage of hemorrhage or other serious complications. When it is possible to make the diagnosis the first week, start the Diathermy then, and the third week is a short convalescence. Where you do not see the patient until he has a hemorrhage, check the hemorrhage with opiates, then go ahead with Diathermy. If a perforation, close the perforation by correct surgical procedure, proceeding with Diathermy through the liver and spleen, even during the operation, and shock will be materially reduced.

By bringing the disease so quickly under control, in the early stage, with physiological heat, the patient does not become emaciated and exhausted and is, therefore, able to return to duty long before he would be out of bed when treated with Antipyretics, intestinal antiseptics and cold baths. Give him light diet, laxatives when indicated, cleansing baths of warm water or alcohol.

Realizing that mountains cannot be moved by man in a day, neither can precedent be

changed overnight in the minds of great men, but I wish to remind you of this thought, which you already know, in speaking of the Typhoid Bacillus, you can freeze him to quiescence, or you can heat him to death, and while in the human body, heat him sufficient to prohibit multiplication, and at the same time open up the avenues for a great on-rush of Leucocytes to the battle field, and they will do the rest in short order, and the human body can stand, without injury, higher physiological heat than the Typhoid Bacillus can multiply in, and with Medical Diathermy heat, we have the means of reaching this happy medium in the deep tissues, of not too hot for the patient, but too hot for the multiplication of the Bacillus, as well as many other infections. Because Typhoid infects only the active age of life, and that we rarely ever see it in small children, or old age, for that reason our mortality, when treated early and often with Diathermy, will be better than Dr. Stewart's mortality with Diathermy applied to the chest in treating pneumonia.

Gentlemen, let us tear down a century old precedent and use Medical Diathermy, early and often, with other modalities when indicated, in our cases of Typhoid Fever, that we might get equally as good results in treating cases already infected with Typhoid, as we have already accomplished with sanitation and inoculation for preventing the spread of this disease in our cities.

DISCUSSION

J. H. Hendren, Straight Creek: Unfortunately I happen to come from Bell county, way up in the mountains where men get shot half the time and are half shot all the time. Up there they call me the goat. If they want any kicking done, they send for me.

I believe as firmly as I believe anything that when a young man gets his diploma from a medical college and starts out to practice medicine, he has the legal right, the moral right, and the divine right to use any agent under heaven that will relieve suffering humanity. If you believe that an onion poultice will ease a suffering child, use it; if you believe that rubbing the spine will relieve a backache, use it. The trouble with us doctors as a class is that we are too narrow. The doctor who says, "I am going to treat all ills with drugs alone," is just as much a quack as the fellow who says, "I am going to treat all ills by rubbing the spine."

You have heard the story of the old fellow who had the sciatic rheumatism. The throat man took out his tonsils and the ear man gouged out his mastoids, the dentist pulled his teeth and the liver man took out his gall bladder and the enterologist took out his appendix and the urologist took out his prostate and the first thing you know the old fellow didn't have a darned thing left but his sciatica.

If we lift ourselves up to broader views, quacks, as we call them, cult medical societies will soon cease to exist.

A few years ago I made up my mind that I was treating fever troubles, pneumonia and typhoid, backwards. I take the view that temperature as we know it is a remedy and not a disease; it is nature's effort to raise the temperature in the body above the breeding point of the germ that is causing the trouble.

Dr. Gibson was right when he said that we have very few germs that are pathologic to the human body, only those that live at the temperature between 98 and 104. Of all the millions of other kinds of germs that we have, or thousands that have been classified, less than twenty-five or thirty are dangerous to the human system. As soon as some of these foreign germs get into the body, nature comes to the rescue by raising the temperature.

For the last five or six years I have not given a single patient with pneumonia or typhoid fever a single thing to reduce temperature. I have religiously kept my hands off the temperature. No cold baths, no antipyretics, no acetanilid, nothing of that kind. I have been more than justified by that procedure.

In speaking of electrotherapy, we have a wonderful agent in the treatment of disease, certain kinds of disease. You can reduce your fatal pneumonia cases to practically nil. You can cut your typhoid fever cases to less than twenty-one days if seen early enough, you can reduce your temperature by elevating it. With a proper diathermy machine you can raise the temperature of a normal body two degrees in thirty or forty minutes. If there is pathology in the lung or pathology in the intestine, the downward curve starts in and it reaches normal or nearly normal in two or three hours. It is true it will go back up some, and then you repeat the dose. This electrotherapy is practically new, but the message that Dr Gibson brought to us is not new. It is as old as medicine—the use of heat in the treatment of disease.

Many of you have heard of Stewart's wonderful success in the treatment of pneumonia. It is just as successful, more so, in the treatment of typhoid fever.

I want to say to you from personal knowledge that Dr. Gibson is a pioneer in the treatment, so far as I know, of typhoid fever with the electric current. It is worth your careful thought and consideration, and I commend to you this very valuable paper.

Austin Bell, Hopkinsville: It is a great pleasure to appear before the State Medical Society, but I do it with trepidation after the oratory of the gentleman who has preceded me. I confess that my methods of treating typhoid fever are so entirely different from the methods that have been presented today that I fear I will be at variance with the profession generally.

I have not gotten very far away from the old methods. I still believe that Hare, one of the greatest practitioners of medicine this country ever produced, is clearly right in this disease as in many other diseases. He says, "a physician must be a watchman all the time and a therapist only as necessity requires." I think in the treatment of pneumonia he made that statement, but it is equally as applicable to typhoid fever as to pneumonia.

I believe it is a question of rest, diet, nutritious food, to maintain body requirements, and baths, tepid or cool to reduce the temperature, are helpful and not harmful. I think the helpful effect of the bath comes more from the effect on the constitution generally than on the temperature itself. In other words, the reduction in temperature is the least good that we get from the bath. The stimulation of the action of the skin, the stimulation of the urinary function, the stimulation of the nervous system, all these things are wonderfully helped by the external application of water.

I think water should be given internally abundantly. Frequently we have our patients coming to the hospital with a low urinary output, concentrated urinary findings, and we begin with water constantly, and in a short while we notice that the kidneys are acting much more freely, the skin is active, the pulse rate is better and slower, and shortly the temperature will begin to recede.

I don't believe there is anything as helpful to the typhoid patient as the free use of fluids.

So far as medication is concerned, I think it bears very little weight in the treatment of the disease. We have no remedy which we can count on being of any material benefit. We do not feel that the antipyretics are especially indicated except the antipyretic of external application of water.

John B. Floyd, Richmond: The paper by Dr. Gibson was unique in that he is offering us a treatment that is untried in the general treatment of typhoid fever. I am of course unable to discuss the doctor's treatment from that viewpoint because I have had no experience with diathermy in the treatment of typhoid.

Dr. Gibson is to be complimented, because I judge from the presentation of his paper that he has given lots of time and thought to it. I would be interested in hearing case reports and a little more specific data in his treatments.

As to the treatment of typhoid, it is of course well said that the more that is said about any subject the less we know about it. We have no treatment for typhoid. You have to treat your patient. The most important thing that is facing the medical profession of Kentucky is not to have typhoid fever, but to prevent it. I still say that the doctors as a whole are delinquent in their duties in not seeing that their clientele is given the prophylaxis to prevent the disease.

George Corum, Corbin: Dr. Gibson is from the same district I am from. You all know that every time we depart from the beaten path we are considered fools or are crucified. I have had experience with typhoid, and a great deal of it. I have not lost any cases of typhoid fever since 1914. I had several cases I thought I was going to lose, but I employed a nurse, changed my treatment, and applied hot packs to the abdomen, and the patient fortunately got well. I did not know that I was carrying out Dr. Gibson's treatment, but it took me from five to twelve weeks to cure my patient or for my patient to get well, while he is able to relieve them in less than three weeks. Why not let us all depart from the beaten path and take up a treatment that will shorten our course of typhoid fever anywhere from five to eight weeks?

R. H. Cowley, Berea: I don't know anything about this method of treatment, but before we accept anything on typhoid we ought to get some idea about how many cases have been treated and compare the results with the results by other methods.

A person can have fifty or seventy-five cases of typhoid and get wonderful results and never lose one, then he can have four or five cases all hand running and lose every one of them.

This presentation that Dr. Gibson has given is very plausible and it sounds mighty good, I think it is worth while trying, but we should not accept it as established until he is able to report enough cases to justify us in thinking it really what he claims for it.

John H. Blackburn, Bowling Green: The Chair would just like to know something about the practicability of treatment with diathermy, as to the apparatus and the portability of that apparatus, if you have some three or four cases. I recall as a youngster that during one summer in Bowling Green, I had twenty-two cases of typhoid fever. It would have been absolutely impracticable to have treated those cases with diathermy with any less than probably ten or twelve portable means of reaching those patients at frequent intervals. As a matter of interest I should like to know something about that.

The Chair will take the privilege of further saying that in those days he had just the experience that Dr. Cowley mentioned, that is of feeling for a time that he was a good typhoid fever doctor, because quite a number of those cases were unquestionably due to a paratyphoid, and they will get well, we know, practically all of them. But whenever we struck one of those honest-to-God typhoids that anybody in that precinct could tell by walking through the room, then our mortality immediately came up.

I should further like to know something about the cases.

T. T. Gibson, Middlesboro, (in closing): I certainly appreciate the discussion. It seems that the discussors have been more favorably

impressed with this new idea than I thought they would be. Because of the custom heretofore, new ideas usually get a pretty heavy blow, I had expected more opposition.

Dr. Hendren is one of our best posted men on the use of diathermy, and while he is always a very capable and interesting speaker, as we can see from his address this afternoon; he was especially enthused today because he spoke from the same rostra on which he made his first speech when a boy, attending college in this building.

Because of the long continued work of Dr. South and Dr. McCormack, of securing better inoculations and a more-wide spread sanitary condition over the State, we don't have near so many cases of typhoid fever, therefore, one man does not have a long list of cases to report. I brought up this new idea of treating cases already infected with typhoid that this idea might be handed out to others, and in that way, the fellow who occasionally might get the infection regardless of sanitation, and neglect of inoculation might still stand a much better chance of recovery, because of a much better method of treating them.

Personally I have treated quite a few cases over a period of five years by this method, I might incidentally report one case treated recently; patient female, age 20 years, had been on a visit to neighboring town, where there had been several cases of typhoid fever, came home feeling badly, called at my office to get something for her headache, on examination, I suspected typhoid, took her home in my car and ordered her to bed, second week temperature was 104, patient delirious widal pos., complication, Hypostatic Congestion so severe, patient claimed she was smothering to death, cough was equal to that of pneumonia. I began using on her once daily, one hour treatments of diathermy using long and narrow electrodes, reaching from lower part of abdomen to well up on the chest, when I called to see her after giving second treatment of diathermy, her temperature was 102, she was comfortable, laughing and talking, and reading her mail, and wanting to know when I was going to let her get up, her temperature ranged for two weeks, from 101 to 99, she did not lose scarcely any flesh, she felt so comfortable it was hard to keep her in bed until it was safe for her to be out; cases where it has been possible to use diathermy twice or more times per day, the temperature has subsided to normal by the end of the first week after diathermy was begun.

Some one asked about the portability of the machine. My portable machine weighs 75 pounds, you can easily set it in your car, and carry it either to the patient's home or to the hospital, where ever there is 110 volt electric light socket, in case of an epidemic it would be better to segregate them to one building, where they could be much easier handled. I have a

large office machine, and a small portable one for carrying to the home.

As to technique, see report of case above, except in absence of Hypostatic Congestion it is not necessary to extend electrode upon the chest, however, one who is not familiar with the use of diathermy, should first acquaint himself with this very valuable instrument, as much so as he would any surgical procedure, before he started to operate.

I hope others will either use or have a Physical Therapist to use for them, this method of treating typhoid fever, until the method becomes in general use, and when it does, a death from typhoid fever, will be a rare occasion.

INFANT DIET AND HYGIENE DURING THE FIRST YEAR*

By A. A. SHAPERO. M. D., Louisville.

Infant feeding bears such a close relationship to morbidity and mortality rates both during infancy and later years that a discussion on this subject is always valuable. The purpose in reading this paper is not to relate new findings but merely to review the practical points and suggestions relating to the feeding and hygiene during the first year.

It is the duty of the expectant as well as the nursing mother to partake of a well balanced diet consisting of fruits, vegetables and cereals in addition to a quart of milk daily. This diet furnishes the vitamins and minerals which are essential for the proper growth and development of such structures as the bones and teeth in the infant.

Needless to say the best food for the infant is breast milk. Many physicians have renewed their interest in breast feeding and are recommending its use in preference to artificial feeding. The expectant mother should be instructed in the proper care of her breasts in order to insure a sufficient supply of breast milk for her infant. The morbidity rate in breast fed babies as compared to bottle fed has been estimated to be about 1:4, so that the breast baby has one chance in four of developing disease as readily as the bottle fed baby.

The new born infant usually weighs about seven pounds (3.2 kilos), he doubles his weight at five months and at one year his weight is trebled. The average gain during the first five months is about five or six ounces a week, during the remainder of the year it is approximately three ounces a week. The breast baby has two or three stools a day while the bottle baby usually has one. The new born infant is permitted to sleep the first twelve hours after which he should be put to the breast two or three times for a few minutes during the next twelve hours to stimulate

the breasts to secrete. Thereafter an attempt should be made to keep the infant on the breast every four hours omitting the early morning feeding if possible. By the third day the baby will usually receive the required amount from the breasts. During this time it is advisable to offer one to two ounces of five per cent glucose or sterile water to partially prevent loss in weight and inanition fever. It also trains the baby to accustom himself to the bottle which makes weaning easier during an emergency. The baby should be on the breast not oftener than every three hours, whereas in the presence of sufficient milk and a normal infant, four hour schedule is indicated. The usual amount of breast milk a baby receives varies according to his ability to suckle as well as the amount of breast milk present. He needs approximately two and one-half ounces (2½) of breast milk per pound of body weight per day or roughly one-sixth of his body weight. Older infants require fewer calories to thrive on so that two ounces (2) per pound of body weight per day is usually sufficient. Between nursings, sterile water or five per cent (5%) glucose solution (one teaspoon to three ounces of water) should be offered.

The number of infants who leave the hospitals in larger cities with artificial formulae is surprisingly high. This condition has not occurred in the rural districts, but at present, artificial feeding is creeping in and replacing breast feeding. Considerable time is spent in instructing the mother in the preparation of the formula whereas this time could be spent to a much better advantage in educating her in the proper care of the breasts, the necessity of continued breast nursing and making her eager to do so. The amount of breast milk is diminished at the third and seventh weeks. The former occurs when the mother increases her physical activity and the latter at seven weeks perhaps to complete involution of the uterus. These periods are crucial since many infants are weaned at this time, when in reality the deficiency can be remedied by having the mother lessen her duties and resting for an hour in the morning and evening. If there is no increase in the amount of breast milk, the baby should be allowed to suckle both breasts at each feeding, allowing one breast for fifteen minutes and the other five minutes. At the next feeding, place the infant at the latter breast first. If in spite of this procedure the breasts do not supply sufficient milk, manual expression of the breasts after alternate feedings is of considerable value in stimulating an increased flow. We are justified in ordering a complementary feeding when the infant does not gain or loses weight after carrying out the above procedures. This formula should be used to

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tide the baby over until more milk is secreted and should not replace the breast feedings. Occasionally an infant is weaned because of curds in the stools or frequent and green stools. These stools are of frequent occurrence and the text-book picture of the golden-yellow stool is not usually the rule. These infants should not be weaned because if breast milk does not agree with them, cow's milk will less likely suit them.

Fortunately many mothers are able to nurse and supply sufficient breast milk for at least the first half of the year, while a great majority are able to do so with complementary feedings. There are some mothers, who, through physical, mental or diseased conditions, are unable to nurse their infants and it is our duty to furnish well balanced artificial formulae which be suitable for them. A baby should be fed according to his expected weight and not according to his actual weight. In prescribing clean whole milk it should at first be diluted with water to which sugar or Karo is added to the extent of one-tenth of an ounce per pound of body weight.

It is not within the scope of this paper to discuss in detail the preparation of the various foods as cereals, vegetables, etc., since the various text-books can be referred to. To simplify matters I have chosen three months of age in a bottle fed baby as a suitable one for which to demonstrate the writing of a formula. I may state that one need not know higher algebra nor calculus to compute this formula. If we order one and one-half ($1\frac{1}{2}$) ounces of whole milk to which one-tenth ($1/10$) of an ounce of sugar is added for each pound of body weight, the formula can easily be calculated. The average weight of a three months old infant is twelve pounds, therefore 12 times $1\frac{1}{2}$ represents the number of ounces of whole milk which is eighteen (18) ounces. Similarly 12 times one-tenth ($1/10$) represents the amount of sugar in ounces or 1.2 ounces. There are approximately two tablespoons of cane sugar in an ounce. An infant can take about two ounces more than his age in months at each feeding so that he could be given 3 plus 2 or a five ounce feeding. The total day's formula is computed by multiplying the total number of feedings by the amount in each bottle. As he is fed five bottles in twenty-four hours, the total day's formula would be 5 times 5 or 25 ounces. The difference between 18 and 25 which is 7, represents the amount of water necessary. Thus this formula would consist of eighteen (18) ounces of milk, seven (7) ounces of water and two (2) tablespoons of sugar. Boiling these together and then dividing the total day's formula into five 5 oz. bottles simplifies the preparation. The bottles and nipples should be sterile and the individual feedings should be kept on ice

and warmed just prior to being offered to the baby. A single formula should not exceed eight ounces nor should the total day's formula include more than a quart of milk.

We can determine whether this infant is receiving a sufficient number of calories by multiplying eighteen (18) by twenty (20) which is 360. Each ounce of milk is equivalent to 20 calories. There are 120 calories in an ounce of sugar. By adding 360 and 120 we obtain 480 calories. A baby at this age requires about 40 calories per pound so that 12 times 40 would equal 480.

During warm weather I believe all milks should be boiled regardless of their bacterial counts. Those with high bacterial counts should not be used as the dead bacteria act as an irritant and often produce gastro enteritis. Wherever ice is not available dried milk or diluted unsweetened condensed milk should be used, preparing each feeding just prior to offering it to the infant. By adding lactic acid to cool boiled milk to the extent of two drops to the ounce the growth of bacteria is inhibited so that this form of milk is valuable during warm weather. Lactic acid milk is used in diarrhoea, rickets, marasmus and infections and has proven itself to be an advance in infant feeding.

I do not believe the nursing mother should be deprived of her social activities and think a supplementary or a substitute feeding for a breast nursing should be given preferably at 10 p. m. It may be given at 2 p. m. if desirable, however, only one bottle should be used daily. This feeding can be started at the second or third month and prepared either from whole milk diluted or dried milk such as Dryco. There are other dried milks on the market as Klin and Reolac which serve the same purpose. At three months a milk formula indicated for this feeding would be $3\frac{1}{2}$ ozs. of milk, one teaspoon of sugar and $1\frac{1}{2}$ ozs. of water. Boil together for three minutes. About three tablespoons of Dryco added to five ounces of warm sterile water will suffice as a supplementary formula at the age of three months. The value in having a baby accustomed to a bottle will well prove itself, should an emergency weaning be necessary, as well as during the routine weaning.

Weaning is indicated in progressive or active tuberculosis, severe nephritis, diabetes or marked hyperthyroidism. In acute or infectious diseases one must decide each case individually as no set rule can be laid down. The weaning of a normal infant should be commenced at the eighth to tenth month and should be gradual, avoiding the summer months. By substituting a bottle for a breast at alternate nursings, weaning over a period of one to two weeks can be safely carried out.

The common dietary conditions which prompt a mother to seek advice of a physician for her infant are vomiting, colic, diarrhoea, constipation and stationary or loss in weight.

Vomiting in the breast fed baby is usually due to overfeeding (excluding spasm or stenosis), while in the bottle fed baby it is due to milk of poor quality or improper composition. By shortening the time the baby is permitted at the breast together with the lengthening of the intervals between feedings, most cases are relieved.

Colic is often due to overfeeding, occasionally to underfeeding, while constipation is sometimes the cause of this disturbance. The usual instance is where the baby nurses hurriedly and cries as a result of being over fed and is again put to the breast because the mother feels he is hungry. Hunger occasionally produces colic and we can determine if it is due to under feeding by weighing before and after nursing. Swallowing of air should be thought of also and this can be relieved by placing the baby over the shoulder and patting his back. The elimination of indigestible articles in the infant's diet is likewise of great assistance.

The causes of diarrhoea are numerous and are divided into two main classes. Those which originate in the gastro-intestinal tract are termed the enteral type, whereas those cases of diarrhoea which are associated with infections outside the gastro-intestinal tract, such as otitis media, pneumonia, and pyelitis are termed the parenteral type. The latter diarrhoeas result from an alteration of the digestive capacities resulting in an indigestion of the food and causing it to act as an irritant or foreign substance in the intestinal tract. It is therefore, evident that one must search carefully and diligently for the source of the diarrhoea in order to treat it properly.

In the enteral form it is safe at the outset to administer a cathartic such as Castor Oil two (2) drams. This eliminates the irritating substances in the gastro-intestinal tract and has an ultimate constipating effect. A short period of starvation lasting from twelve (12) to twenty-four (24) hours during which fluids as tea and barley water are vigorously given often may abort a severe diarrhoea. Fruit juices are avoided and boiled, diluted, plain or acidified skimmed milk is given at first, gradually increasing the strength of the formula until the original one is reached. The solid foods as cereals and vegetables are added later. If the diarrhoea is seen late, no cathartic should be given but a weak formula together with a considerably increased fluid intake is indicated. In severe cases a blood transfusion, using the fontanel or intramuscular route, can be resorted to. The success with the parenteral type consists in the usual treatment of the cause and the administration

of acidified milks as skimmed lactic milk or buttermilk.

Constipation is usually due to underfeeding and less often to overfeeding. Many mothers believe their babies fed with the bottle, are constipated if they have a single dry movement daily. This is not true however, as the latter is a common occurrence in normal infants. As the intestinal tract of the baby behaves like that of the mother, hygienic treatment of the latter should be instituted. The treatment of constipation in the infant does not lie in the administration of mineral oil, milk of magnesia or suppositories, and the mere fact that it tends to become worse with the continued use of these remedies warrants their condemnation. The addition of fruit juices and solid foods often remedy this condition. An occasional saline enema may be used without harm.

A stationary or declining weight curve in the absence of other disturbances as vomiting or diarrhoea indicates that the diet is insufficient and needs to be increased.

The infant's diet should be of such nature as to prevent rickets, scurvy and malnutrition in addition to supplying his needs for growth and development. Orange juice and canned tomato juice being rich in vitamin C are valuable in preventing scurvy and should be commenced at the second month. Cod liver oil contains the anti-rachitic factor or vitamin D and is valuable in the prevention of rickets. It is commenced at about the same age as orange juice. During the hot months the dose of Cod liver oil is diminished to prevent anorexia and vomiting.

At five (5) months, well cooked cereals, as cream of wheat, farina, rice or oatmeal can be added to the infants diet. Vegetables, such as cooked carrots, peas, spinach and green beans are usually given at the seventh month. Beef broth is commenced also at this age. At nine months, toast and crackers can be given, and at ten months a coddled egg can be offered. Scraped beef can be fed the infant at the end of the first year.

As to the baby's hygiene, he should receive tepid sponge baths, using a mild soap, until the umbilicus has healed, thereafter, tub baths are permissible, the infant massaged with olive oil subsequently, during the first month. He may be taken outdoors at one month if the weather permits such as temperature above 40 F. During cool weather he should be well protected, while during the summer a minimum of clothes should be worn. The infant is usually able to hold his head erect at three (3) to four (4) months, sit alone at seven (7) months, has eruption of teeth at the same age and is able to walk and talk at one year. It is not advisable to play with the infant during at least the first half

of the year and preferably the entire year, as it disturbs his sleep and makes him irritable. Needless to say the infant should not be kissed as this is a common mode of conveying communicable diseases. The hygiene of the mouth consists in preventing soiled objects entering it and the avoidance of useless cleansing.

During the first year the breast baby has all the advantages over the bottle fed baby, while the reverse is true during the second year, the one on cow's milk resists infection and disease better than the baby who has been continued on the breast. This is due to the fact that but few mothers are able to furnish sufficient milk after ten months of lactation.

In conclusion, I will feel this paper has well served its purpose if it will disseminate the discussion and knowledge of the value of breast feeding and also promote the improvement and handling of cow's milk.

DISCUSSION

R. Julian Estill, Lexington: This is a subject that is always interesting and apropos, because it is a subject we are all concerned with. After all is said and done, the general practitioners see more babies and more sick babies than any one else. I am glad to see a subject of this kind brought before this body.

I have nothing to add to what Dr. Shapero has said, because he has said it better than I could. I will say a few things that I want to emphasize, simply to give you somebody else's commendation of what he has already said.

I am going to start by disagreeing with him just a little bit about the diet of the mother. We know that if cows eat wild onions you can't drink the milk. I believe that applies to the mother. My experience has been that acid fruits like orange and grapefruit and lemon, and particularly raw tomatoes, are very apt to colic the baby, (I don't know whether that has been a general experience or not,) so much so that when the babies are turned over to me at the end of the obstetrician's term, I automatically eliminate those things from the mother's diet. I have frequently seen children who have had colic and have been upset generally, and I believe many of those children (I don't believe you can say always anything in medicine) will have less disturbance in breast feeding if you do eliminate these things from the diet. I always tell them I am not going to give them a specific diet, but rather state orange, grapefruit, raw tomatoes and raw fruits of any kind are to be avoided. Cooked fruits and cooked tomatoes are all right.

Dr. Shapero has properly emphasized the importance of breast-feeding.

It has been my custom for several years to try to eliminate that initial loss of weight that comes immediately after birth. I believe we can do that in a good many cases by starting to bottle

feed the child when he is six hours or twelve hours old, and that is particularly important for the premature or under-sized child, not to lose any more than they can help during that first day or two, because it often takes ten days or two weeks or maybe a month to gain back the birth weight. I believe you can give them a weak formula; ordinarily I use skimmed milk in making up the formula for the new-born babies, they take it perfectly well, they learn to take the bottle, and I believe it is a help in keeping them from the initial loss that so many will have without it.

The essayist emphasized properly rest to the mother. We know, again, in our live-stock that a cow that races and rips around, and is nervous and upset over anything, is not going to give good milk. The mother can't either, any more than the cow. I think it a very important thing to impress upon the mother that she get plenty of rest. In the first place, she has gone through with a long siege, her nine months of pregnancy, her labor, and then she has the baby on her hands and is nervous about that. If she gets up early in the morning, goes hard all day, when night comes she is physically, mentally, and in every other way, exhausted. If you impress upon her to lie down for an hour or two after her mid-day lunch (if she can't do more than that), I believe that is an important thing.

The essayist also emphasized another thing that I think is important. Do not wean a baby just because there are curds in the stools. Gain in weight is the thing that means most. If a baby is gaining weight, I don't care what kind of stools the baby has, as many or any kind they want if the baby is gaining weight. That is the final criterion of success. If you have any difficulty with breast-feeding, you are going to have a good deal more trouble with anything you can mix up and put in a bottle, I think that is extremely important.

I think, oftentimes we can stop the child from having curds in the stools by looking to two or three things. In the first place, the diet of the mother will often do it. In the second place, the child may be nursing too long at a time or too frequently. I think most babies want to nurse every three hours. I try to nurse them every four hours, but most babies, in my experience, want a three-hour nursing for the first three or four months anyway. I get them to the four-hour schedule as quickly as I can, but many of these children with curds in the stools, and gas, you will find are nursing for twenty minutes or twenty-five. They are filling their stomach with air and are getting too much. If you will simply cut down the length of time of the nursing, many of these cases, with curds, green stools and so on, will clear up automatically.

J. H. Pritchett, Louisville: As the essayist started to read, I began to say to myself "Amen."

I am almost hoarse.

Sometime ago I read an article (I can't quote the author nor where I read it) on child hygiene, and the author prefaced his remarks thusly: "Every man was once a baby." Unfortunately, most men have forgotten this fact, and not the least of these is the physician, if we may judge from his lack of desire for information concerning the infant.

I think that every general practitioner, and certainly every obstetrician, should know a great deal about the infant. His or her duty, in the case of a woman doctor, is not completed on merely tying the cord and turning the baby over to the grandmother or to a nurse or to some idle neighbor and saying, "I have done my part. It is your burden." This is a great mistake. For this very reason our infant mortality is, unfortunately, rather high. The physician should acquaint himself personally with the individual needs of the baby. All babies are different; they are a law unto themselves. We have no right to try to force a formula on a baby unless the child is able to take care of that formula. In other words, the formula should be made for that particular baby, not the baby for the formula.

I was, indeed, glad to note the essayist's apt remark concerning maternal nursing. As he justly says, this is decreasing. Among the factors which are causing this (I think I am safe in saying this) is the rapid rate of living. The mothers receive too little rest. In the case of quite a few of them, unfortunately, too many cigarettes, too little sleep, disturbed tranquility and financial worry. All of these things have a direct bearing upon the nursing mother. For this reason, we would do well to pay very close attention to these matters: her rest, her food, and so forth. I know of no other phase of medicine in which the physician has so little control over his patient as in the case of the infant. Unfortunately, the neighbor who has had twelve children of her own and has lost half of them, possibly, knows just what the baby needs, the doctor doesn't. Frequently they implore the mother to wean her baby because the baby has a little colic, or because there are a few curds in the stools, and before the doctor has a chance to correct the trouble, dietary or otherwise, the baby is weaned, put on some proprietary food and they call you in later when the child is in bad condition.

Next to breast milk, of course, as we know, is clean cow's milk. When we are unable to obtain this, I have no objection at all to other preparations, such as condensed milk, over a period of time (I won't be quoted as saying it is the best milk; it is not), or some dry milk preparations with which you are familiar. I further would have you dissuade your minds from the disillusioning facts as put out by some wholesale

houses with this sign: "Our preparation will do all that you need in your infant feeding."

Some few weeks ago, I had under my care a nursing infant, breast fed, in which there was a little trouble with curds, and colic at nighttime. The 'phone would ring at eleven or twelve o'clock at night: "Doctor, the baby is colicking again, can you hear?" I could. I went by the next morning to see the child, and when I knocked at the door I was met by an old maid (and they are all right) who said: "Doctor, have you ever used S. M. A.?" That means, by the way, synthetic milk adapted, a very good preparation to use under the doctor's directions. I said to her, "What does that mean?"

"Oh," she said, "that means sweet milk aged."

The mother was going to accept this poor woman's advice against my better judgment. We finally persuaded her that that was the thing not to do. I believe we should pay more attention to the babies, especially obstetricians and general practitioners, encouraging the mother to bring the baby back for examination, and watching the weight curve very closely. The baby should be weighed every week, as the essayist has well said. If you are at all in doubt, you can weigh the baby before and after each nursing and determine what it lacks, and, in that way, make up the deficiency.

A. A. Shapero, Louisville, (in closing): I hope I did not leave the impression that the mother can eat everything she wants. It was my idea in writing the paper to incorporate that phase of it. I don't believe the mother should eat foods such as raw onions, as Dr. Estell mentioned, nor any food which is irritating. Any food which is highly stimulating should be eliminated from the diet.

I think it is a pretty good rule that if the mother can digest her food very well, it won't hurt the baby.

Another thing I did not mention in the paper is the time at which we start cereals. I mentioned five months in the paper, but in the clinics that I have worked in, some men have started at three months, which is very early, and do not have any ill effects.

Another thing is the difference in the percentage of breast feeding in the white and colored races. In the colored race, we find a higher percentage of breast feeding than among the white race, because they have less social duties, they care less about the outside, and they have pleasure in nursing their babies.

In closing, I want to mention that if a baby is weaned from the breast and becomes ill, or it is necessary to re-establish the breast feeding, it can be done. After a baby has been off the breast for a month, three weeks or six weeks, by stimulating the breast properly, the breast milk can be re-established.

PEPTIC ULCER: EVALUATION OF METHODS OF DIAGNOSIS AND TREATMENT*

By A. M. McKEITHEN, M. D., Louisville.

Within comparatively recent years the medical profession has made great progress in the diagnosis and treatment of peptic ulcer. General opinion of the profession regarding treatment has never been unified. It ranges from those who advocate medical treatment for practically all ulcers to those who advocate resection of a large part of the stomach for a small benign duodenal ulcer. I shall attempt to present a conservative evaluation of the methods of diagnosis and treatment—to outline a resume of the present status of ulcer.

The manifestations of chronic peptic ulcer in its uninterrupted course are many and varied. It may heal spontaneously; it may heal under medical management; it may proceed to the development of one or more of several complications, as obstruction, perforation, hemorrhage, and in gastric ulcers of malignant degeneration. These varied manifestations explain the necessity for varied methods of treatment. And it is usually true that an unsatisfactory result is due to an injudicious selection of the method of treatment.

The frequency with which scars of the healed ulcers are encountered in the autopsy room proves undoubtedly that many ulcers heal spontaneously. Still others heal under a very simple medical regime and others may or may not heal under more or less elaborate methods of medical management. Why some ulcers will heal and others resist all attempts at medical treatment is not known. Mann and Caylor have shown that there is always an attempt at healing, by the formation of granulations in the base of the ulcer, and by epithelium growing out from the edges to cover it over. Mann thinks that the destruction of the epithelial covering either by trauma or by autolysis, may be responsible for the intermittent activity with exacerbation of symptoms which is commonly seen. He also believes the destruction of the granulation buds may often be responsible for hemorrhage. Morton has shown that the location of the ulcer may be a factor in healing. Ulcer may be produced experimentally in any portion of the stomach, but those along the lesser curvature are much more resistant to attempts at healing than those in other portions. The force of peristaltic contractions is toward the lesser curvature and hence more trauma there is the probable explanation for the preponderance of lesions in this location.

One of the most prominent features of ulcer

of the stomach or duodenum is its chronicity and once established, it is one of the most chronic organic diseases with which we have to deal. Ulcers in both locations are also characterized by their periodicity, that is, by periods of remission or absence of symptoms and by periods of exacerbation. This is usually true regardless of the type of diet taken and is somewhat more characteristic of duodenal than of gastric ulcers.

Chronic duodenal ulcer is a common disease where-as chronic gastric ulcer is relatively rare. Duodenal ulcer in relation to gastric ulcer occurs in the proportion of ten to one, and cholecystic disease in the proportion of eight to one. Peptic ulcer is much more prevalent in men than in women, the proportion being four to one. Malignancies of the stomach in relation to benign ulcer occurs in the proportion of three to one. The common age for the occurrence of ulcer is between twenty and forty.

DIAGNOSIS

Accuracy in the diagnosis of peptic ulcer is the highest of any field with which we have to deal, as the condition can be accurately determined in 96% of the cases. A thorough understanding of the symptomatology and the visualization of the lesion by the x-ray has made this possible.

The symptoms are, as a rule, very clear cut, the chief symptom being pain. The onset is usually gradual, beginning with a feeling of slight epigastric distress coming with definite relation to meals. Later the pain becomes more severe, of a gnawing or boring character. It is generally true that the nearer the location of the ulcer to the esophagus, the earlier the onset of pain after eating. However, it is not possible to make an accurate differential diagnosis as to whether the location of the ulcer is proximal or distal to the pylorus by the time interval at which pain occurs. In three out of five gastric ulcers the onset of pain will be within one and one-half hours after eating, while in duodenal ulcers the pain in four cases out of five comes two hours, or longer, after food is taken.

Patients with ulcer pain usually learn early in the course of the disease that the pain is relieved by the ingestion of food and they frequently eat between meals, many of them carrying always with them something to eat, such as milk or crackers. In addition to relief from food, the pain may be relieved by the taking of alkalis, and often by vomiting or by lavage. One of the most characteristic features of the pain in ulcer is the regularity with which it comes after each and every meal. Every meal that is taken, even light meals, is followed by pain. And, indeed, if it does not make its appearance regularly, and if it is not relieved by taking food and soda, one must

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hesitate about making the diagnosis. The patient is often awakened at night by pain, and many patients keep some food, such as a glass of milk, by the bed every night to be taken in order to get relief.

Another typical feature of peptic ulcer is its periodicity, with its intermittent periods of exacerbation and remission of symptoms. The periods of activity commonly occur in spring and autumn, and last from a few weeks to several months. During periods of activity the type of diet has little or no effect on the presence of pain, and during periods of intermission even a rough or heavy diet, or any marked indiscretion in diet, usually causes no trouble.

In acute perforation of the walls of the stomach and duodenum due to ulcer we are confronted with a typical picture. The perforation may follow symptoms of long duration with, as a rule, a rather marked exacerbation of symptoms for a time prior to the perforation, or it may come on very acutely with little or no previous digestive disturbance. When perforation occurs there is a sudden onset of excruciating pain which may in the beginning be localized, but which soon spreads to the entire abdomen. In contrast to the pain seen in gall-bladder or renal colic where the sufferer writhes in agony and continually changes position, a patient with a perforated ulcer is quiet and moves very little, as a rule, every movement seems to aggravate the pain. Examination will show general abdominal tenderness and the most indomitable rigidity of all the abdominal muscles, and especially over the region of the ulcer. There is little or no change in the rate and the quality of the pulse for several hours, or until after peritonitis has set in. The temperature may be subnormal at first, later becoming gradually elevated. In chronic perforations there is a minute break which becomes walled off from the general peritoneal cavity by adhesions to the omentum or adjacent organs.

The next symptom in order of frequency is vomiting. Vomiting is more commonly associated with obstruction and when it is, the obstruction is usually of a marked degree. In these cases it is of the retention type, often large quantities being vomited, which may contain food taken one or two days previously. Vomiting may be associated also with uncomplicated ulcer in certain individuals, and is at times self-induced, as patients learn that they may obtain relief by vomiting. It is not seen in over 50% of the patients, and in some of them rarely, and usually after dietary indiscretions. One soon learns from experience the type and quantity of food that the stomach will tolerate.

Hemorrhage, as evidenced by hematemesis or melena, is encountered in about 25% of the

cases of peptic ulcer. There are several other causes for hemorrhage from the stomach, such as splenic anemia, cirrhosis of the liver, and some toxic conditions which are usually intra-abdominal. Hemorrhage from these conditions is due to a rupture of esophageal varices or to multiple minute breaks in the mucosa of the stomach. Bleeding from the stomach is characteristically manifest by the dark, tarry stools, or by the vomiting of blood which has usually a dark coffee-ground appearance. In case of a rupture of a large vessel the vomitus may contain bright red blood.

The degree of acidity of the stomach contents is commonly higher than normal in the presence of peptic ulcer, but it does not occur constantly, and as it may occur in association with other conditions, it is of practically no aid toward diagnosis. While hyperacidity is commonly encountered, in about 40% of the cases hypoaclidity or anacidity is seen. This latter type responds more unsatisfactorily to treatment, either medical or surgical, than the former.

Due to the work of Carmen and others the roentgen-ray has become the most indispensable asset in the diagnosis of organic lesions of the stomach and duodenum. In the roentgenologic examination the characteristic deformity is seen so that the diagnosis may be made with certainty in most cases. The x-ray may establish the diagnosis by revealing the typical deformity even when the history is not entirely characteristic. In the absence of positive x-ray findings the presence of ulcer may be assumed if we have the typical history. A healed ulcer will produce a deformity as seen in the x-ray, and we must always remember that it does not show whether the ulcer is active or inactive, and the symptoms may be due to disease elsewhere. Disease of the gall-bladder or the appendix is so commonly associated with ulcer that we should bear this in mind especially in the presence of a history suggesting it, or when patients do not respond satisfactorily to the medical ulcer management.

TREATMENT

Ulcers of the stomach and of the duodenum should be definitely segregated as regards treatment. The treatment for all ulcers of the stomach should be surgical if the patient's condition is such that operation is at all feasible. Prolonged medical treatment for ulcers of the stomach is never justifiable, although as preoperative procedure for improving the patient's condition it is frequently indispensable.

The complications commonly seen in gastric ulcer are the chief reasons for treating all ulcers of the stomach by operation. According to Balfour, hemorrhage, obstruction, perforation, malignant degeneration, and

hour-glass deformity, in the aggregate, are met with in 61% of gastric ulcers seen at operation at the Mayo Clinic. Every one is agreed that surgery is the only means for effectively relieving these complications. In the surgical treatment of gastric ulcer one should, when possible, always take measures to remove or destroy the ulcer. The operation commonly employed are gastro-enterostomy, excision, destruction of the ulcer by the actual cautery, and by resection of a portion of the stomach. Alvarez and McCarty have recently studied a series of excised ulcers in an attempt to come to some conclusion regarding the association between the size of the ulcer and its pathological benignancy or malignancy. They have shown that gastric ulcers are seldom larger than 2.4 cm. in diameter, and that carcinomatous ulcers are seldom smaller. The upper limit of size for benign ulcer is found to be 3.5 cm. in diameter. They found that 23% of carcinomatous ulcers resected at the Mayo Clinic are in the range of size of benign ulcers, and as the malignancy of these ulcers usually cannot be definitely determined except microscopically, this alone is sufficient evidence for the complete removal of every gastric ulcer when it is possible.

In benign ulcers gastro-enterostomy alone gives good results in about 50% of the cases. Gastro-enterostomy combined with excision, either with the knife or with the actual cautery, raises the percentage of good results to about 80%. The operation of excision and gastro-enterostomy is satisfactory for small ulcers that are advantageously situated for the employment of this operation.

A resection of the stomach or a partial gastrectomy is suitably adapted for the treatment of ulcers situated near the pylorus, or for large ulcers where excision would produce too much deformity of the stomach. For large ulcers near the middle of the stomach, or in cases of hour-glass contraction, the sleeve resection is sometimes employed. There are several methods of partial gastrectomy, either one or the other of which may be especially suitable for use in certain cases, but in recent years the operation most generally used is the Polya, in which the resection is done, and the end of the stomach anastomosed to the side of the jejunum, either anterior or posterior to the transverse colon. For lesions near the cardia, or otherwise inaccessible, and those perforating into the liver or pancreas, which are commonly seen in patients of low vitality where, because of the high risk any extensive operation is prohibited, jejunostomy has proven to be of great usefulness. Gastro-enterostomy should be combined with it if feasible. Feeding may be continued for an indefinite time through the jejunostomy, placing the stomach at complete rest. This may

allow the lesion to heal at times, or the induration to subside to such an extent that resection will be possible at a later time.

In all cases of large or repeated hemorrhage from peptic ulcer or either the stomach or the duodenum surgical treatment should be employed, and when technically possible, the ulcer should be excised. Gastro-enterostomy alone offers only a fair chance of relief in these cases. For bleeding ulcers of the stomach excision and gastro-enterostomy, or partial gastrectomy, are the operations of choice. For bleeding duodenal ulcers excision with some form of pyloroplasty is preferable, although in these cases gastro-enterostomy offers a greater chance of relief than in bleeding gastric ulcers. Operation for bleeding ulcers should not be performed during the stage of active hemorrhage, but as soon thereafter as the patient's condition warrants. During the stage of active hemorrhage the patient should be carried along on a very strict regime of medical management, the primary object of which is to place the stomach as near as possible at a stage of complete rest by withholding everything by mouth so as to afford the opportunity for the formation of a clot or thrombus in the bleeding vessel. During operation a thorough exploration of the spleen, liver and other organs should be made to determine if there may be other cause for hemorrhage.

In acute perforations the necessity for urgent and immediate operation is quite obvious, and the patient's chances for recovery are in proportion to the time interval which has elapsed following the perforation. The principle of simplicity and safety which should be applied to all surgery is more urgently applicable here. An attempt should be made to close the perforation either by suture or by plugging the hole with omentum. At times, because of the conditions which are presented, this may not be feasible and excision of the ulcer may be necessary. The question as to whether or not gastro-enterostomy should be combined with suture should depend upon the patient's condition for tolerating additional surgery. As a rule, it would be preferable, but generally one would not be justified in doing more than simple closure of the perforation.

We have seen why we are not justified in prolonging medical treatment of gastric ulcers, but with duodenal ulcers it is quite a different matter. Malignancy of the duodenum occurs so rarely that we can ignore it completely. Duodenal ulcers heal more readily under medical management, and when once healed are more prone to remain so than gastric ulcers. Many clinicians have devised various diets and methods of treatment, but that popularized by Sippy, is the one that is

probably in more common usage than others, and it meets the requirements very satisfactorily. The fundamental principle in the medical treatment is frequent feeding and alkalization. The diet should be both chemically and mechanically non-irritating, easily digested, and quickly emptied from the stomach.

Except in complicated cases demanding surgical relief all duodenal ulcers should be given every chance of medical cure. Especially in younger individuals, is this true. As to how long medical treatment should be persisted in, depends upon the results being obtained, the economic status, the age, the duration of symptoms, the degree of disability, and upon the patient's willingness and ability to co-operate. Where the results of treatment are satisfactory, restricted diet should not be continued too long, because of the psychic disability which it imposes upon one. A gradual return to more or less full diet after a period of three to six months seems to be satisfactory. After operation the restriction of diet should be continued for about the same length of time.

The complications of duodenal ulcer, namely obstruction, hemorrhage, and perforation, either acute or chronic are indications for operation. Surgery is also indicated in those cases which do not respond satisfactorily to medical treatment, and where the degree of disability is such as to incapacitate the patient for carrying on his routine duties, or where his economic condition is such that a suitable regime of treatment is impracticable. In chronic ulcers of long duration, where there is considerable fibrosis, healing is seldom accomplished without the aid of surgery. In a young person medical treatment should be given a very thorough trial, and operation deferred as long as even fairly satisfactory results can be obtained. In the event that obstruction or increased fibrosis occurs, surgery would be more satisfactory. In the severe cases, and in the mild cases that resist all attempts at medical treatment, surgery offers the only chance of relief.

In the surgery of duodenal ulcer, excision, with some form of plastic operation which destroys the sphincter action of the pyloric muscle, is preferable in selected cases; that is, when the ulcer is on the anterior wall and is easily accessible for this type of operation. In young people, or in those with a comparatively short history, excision is more urgent, because of better results obtained.

Gastro-enterostomy in the presence of an obstructive lesion of the duodenum gives the best results obtained in abdominal surgery, and for the all duodenal ulcers it is considered by many surgeons to be the operation of choice. It is not a mutilating type of operation, and if the occasion demands the anastomosis

can be disconnected and the stomach and jejunum restored to their preoperative condition. The operation should never be performed except when the lesion can be positively demonstrated on the operating table. The posterior gastro-enterostomy is to be preferred when possible, although the anterior type of anastomosis is a good substitute where, for any reason, the posterior cannot be done.

SUMMARY

Duodenal ulcer is common, whereas gastric ulcer is relatively rare. Differential diagnosis cannot always be made except by the x-ray. Peptic ulcer is characterized by chronicity and periodicity. The chief symptom is pain which occurs at a definite interval after eating, and after each and every meal, and usually at night. Pain is typically relieved by ingestion of food and alkalies. Vomiting and hemorrhage occur in a small proportion of the cases. The accuracy of diagnosis by the roentgen-ray is very high. The treatment of gastric ulcer should be surgical and every attempt should be made to excise it. Duodenal ulcer should be given ample opportunity to heal under medical management; surgery should be employed where there are complications, and in all cases that resist medical treatment. During the past decade great progress has been made in the diagnosis of peptic ulcer, and as conservative a line of treatment as will safely effect a cure is to be preferred in evaluating the various methods.

DISCUSSION

S. C. Smith, Ashland: It was my privilege about a year ago to hear two of the leading men in the United States, one on surgery and the other on internal medicine. The internist devoted practically all of his time to treating diseases of the stomach. The conclusions of these two men were extremely interesting. The stomach man, the man who treated by medical means, wound up his address by stating that all the methods developed up to this time, were unsatisfactory. He reported a large number of cases, with follow-up over a number of years to prove his conclusions. Some of the cases that he thought were well, when he x-rayed them, showed that the ulcer was much larger and much more vicious looking than it was at a previous examination.

The surgeon wound up his address by making the same remarks. After doing a few of these cases myself and observing a large number, I have come to the conclusion that surgery is only indicated in either gastric ulcer or duodenal ulcer where you have some mechanical obstruction, where you have a perforation, or where there is a suspicion in the peptic ulcer that malignancy might be beginning.

So far as gastro-enterostomy is concerned as

a combined method in treating duodenal ulcer, the percentage of recurrences around the new opening and the symptoms of discomfort following are conclusive proof that we have not yet found the best solution of this question.

I wish to repeat that it is my opinion, based on the work that I have seen men of wider experience do, and on the small number of cases that I have had myself, that we should never operate in either type of peptic ulcer unless we have a mechanical obstruction or a perforation or a suspicion of malignancy.

To confirm this point, I wish to report briefly a case that I saw at one time. I was called to see this young fellow with an acute abdominal pain, with every evidence of a rupture of a peptic ulcer. He was rushed to the hospital and operated upon as soon as possible. A large anterior ulcer on the stomach was found, about the size of the thumb. The margins of the ulcer were excised and the ulcer was closed. The man showed improvement and it seemed as if he would get well. After a certain number of days, his condition became worse and he died. A post-mortem was done, and in doing the post-mortem the esophagus was tied off and the duodenum below and it was found we had a perforation of the duodenum as well. The stomach was opened and eight healed ulcers were found in the stomach, and three active ulcers, one of which was practically perforated. A few muscular fibers and the serosa were all that remained.

Frank T. Fort, Louisville: I think Dr. McKeithen gave us a splendid paper, quite conservative, and to the point. I agree with practically everything he said in his paper, but from my experience, I feel that in dealing with these ulcers we should more particularly care for the opening when we do a gastro-jejunostomy. I have seen several cases where the opening was not made large enough, which I feel makes the return of an ulcer much more likely.

There is another phase. I have recently seen a case in which, with the gastric juice pouring down on the jejunum, there was an ulcer of the jejunum. It ruptured and I was up against a tough proposition, so tough that the patient died. He had gastro-jejunostomy done one year, the next year he was operated on again and a larger opening made, and the next year he had perforation of this jejunal ulcer. I feel, if a jejunostomy could have been made, it would have prevented that, or if the man could have been urged to carry out a strict dietary regime, his life might have been saved. Only the day before he had a perforation of the jejunal ulcer, he had eaten a big hamburger steak. I feel that one who has had an operation on the stomach should be forced to dietary regime just as one suffering from nephritis or from diabetes or from any

other condition where diet has a great bearing on longevity.

I agree with Dr. McKeithen that all gastric ulcers should be operated on. The gentleman who preceded me said it is impossible to tell when a benignity leaves off and a malignancy begins, so I think when you know you have a gastric ulcer an operation is indicated, but not so in duodenal ulcers. Recently, I had a case of duodenal ulcer in which the x-ray showed no change, no distortion, nothing that would indicate a duodenal ulcer. I was inclined to think it was referred pain from a little trouble which he thought he found in the left kidney. The next day this patient had a massive hemorrhage from the duodenal ulcer, which forced me to believe that the duodenal ulcer was on the posterior aspect of the duodenum and there was no perforation, which caused the failure of the x-ray to demonstrate it.

In Finney's operation, if the duodenum can be drawn up, I think it is ideal for the duodenal ulcer, and the resection of a large enough opening if gastro-jejunostomy is done.

A. M. McKeithen, Louisville, (in closing): I wish to thank the discussors. I think all gastric ulcers should be treated surgically.

Balfour, at the Mayo Clinic, found that sixty-seven per cent of the cases of gastric ulcer showed complications with either obstruction, hemorrhage, perforation, malignant degeneration or hour-glass deformity. In many cases, even after you have them on the operating table, it is impossible to tell whether or not the ulcer is benign or malignant, and it is frequently left to the pathologist to give us that information after the ulcer has been excised.

There is one other thing to do in the way of treatment, which is to remove all foci. Rosenow in his work on focal infection and the selective localization of bacteria, has undoubtedly proven that many ulcers result from this, and all foci of infection should be thoroughly cleaned out, whether the treatment is medical or surgical.

Use of High Frequency Currents in Treatment of Prostatic Disturbances.—Arnold reports a case of adenoma of the prostate in a man, aged 58, who had considerable pollakiuria, severe pains on urination, 75 cc. of residual urine, and fever and was in poor general condition. He was completely cured by two treatments of electrocoagulation applied to the prostate through the urethra. In all cases of urinary disturbances caused by small hard sclerous prostates or by medium sized or by partial (medium part especially) hypertrophy of the prostate, the author uses high frequency currents for boring into the prostate through the urethra or transvesically, after a suprapubic cystotomy. In the casts of large prostates he performs prostatectomy.

REPORT OF CASES TREATED BY VENOCLYSIS*

By GEORGE A. HENDON, M. D., F. A. C. S.
Louisville.

The subject I wish to present to you is the gradual administration of fluid for artificial nutrition. We are all thoroughly familiar with the massive introduction of fluid substances by the stomach and by hypodermoclysis, but I believe gradual administration possesses enormous advantages which are quite obvious. When a dose of anything is administered by the stomach, the rate of absorption is materially controlled by the absorbing power of the gastric mucosa. A massive dose of any substances introduced into the vein or directly into the circulation, might embarrass the vital forces and prove harmful. Therefore, I think the gradual administration of fluids for artificial nutrition possesses a distinct and vital advantage. When we introduce fluid by rectum we call it proctoclysis, when under the skin is known as hypodermoclysis, when directly into the circulation we call it infusion or transfusion; but the gradual administration of fluids into a vein should, I think, be called venoclysis.

This problem becomes very simple on account of the fact that nature has provided us with at least four veins so situated and constructed as to really invite this type of treatment. I refer to the cephalic and the basilic veins which have no important branches between the elbow and their point of entrance into the axillary veins. This fact is of especial advantage as in consequence there is slight danger of the formation of clot when the vein is employed for the purpose indicated.

I desire to briefly report five cases in which venoclysis was employed. I have used this method in severe cases where it became imperative to maintain nutrition by artificial means for the last three or four years, and have never yet seen the formation of a clot nor any other untoward effects from the procedure.

CASE REPORTS

Case 1. Mrs. R., aged 30, referred by Dr. J. M. Morris, admitted to hospital December 18th, 1927, dismissed January 7th, 1928. Patient has four children, oldest aged eight years, youngest eight months. Has had one miscarriage. Last menstruation September 17th 1927. Admitted because of constant vomiting which had continued for two months and had become worse during the past two weeks. Patient unconscious and delirious when admitted.

Urinalysis, December 18th: Reaction acid, specific gravity 1021; albumin negative, bile

a trace, sugar, a trace. Patient jaundiced. December 26th: Reaction acid, specific gravity 1030; albumin faint trace, sugar present. Blood sugar 136 mgm. per 1000 c. c. January 7th, 1928: Reaction alkaline, specific gravity 1006, albumin and sugar negative.

On December 18th date of admission, the patient was given digitoline and morphine hypodermatically; panopepton and cracked ice per ore. Normal saline solution 1000 c. c. by hypodermoclysis, glucose and soda by proctoclysis. Some improvement noted for forty-eight hours, then relapse occurred.

On December 23rd, five days after admission, venoclysis started. The patient was delirious, pulse weak and could not be counted. The fluid used was 10% glucose in normal saline. She received one quart every six hours, one gallon in twenty-four hours, or 4000 c. c., aggregating 400 grams of dextrose in twenty-four hours. The rate of administration was approximately two drops per second. The patient continued restless and complained of headache. Sufficient morphine given to control pain and keep her quiet.

December 24th patient seemed better and more rational, pulse 116. December 25th, had a "fair" night, general condition seemed improved. At 5:45 p. m. she was highly nervous and complained of pain in region of heart. Pulse 136. Morphine, $\frac{1}{4}$ grain hypodermatically, produced relief. December 26th, she had a fairly comfortable night, but continued to vomit at two to three hour intervals. Urine output in last twenty-four hours 75 ounces.

December 27th patient comfortable, had a good night, pulse 110. Canula slipped and was removed. (Canula should have been tied with silk instead of catgut). Patient resting comfortably, slept soundly. Urine output 40 ounces, had a good day. She slept Sunday, complained of feeling sleepy most of the time. December 28th, excellent night; drank water freely, food permitted ad libitum; she ate cheese, lettuce sandwich and potatoes; had a good day. December 29th, passed a comfortable night. Had post-toasties, cream and sugar, dry toast and bacon for breakfast. Patient eating everything, including liver and baked potatoes, steak, etc. December 30th, good day, had sauer kraut for dinner. Jaundice disappearing; was in chair 15 minutes. December 31st, sitting up, good appetite, regular diet allowed. January 1st, 1928, eating between meals. Rapid improvement, without notable incident, until dismissed January 7th. She has pursued a normal course since then.

Case II. P. B., female, aged 19, six months pregnant, admitted January 15th, 1928, dismissed February 4th. Provisional diagnosis: "premature labor, pyelitis." Venoclysis be-

*Read before the Jefferson County Medical Society.

gun January 17th, discontinued January 22nd, operating continuously for five days. Fluid used, 5 per cent to 10 per cent glucose in normal saline solution.

The patient gave the history of having been ill for several weeks. When admitted the morning of January 15th, she was having pains simulating labor at half hour intervals and was vomiting copiously of greenish fluid. Temperature 101° to 102° F., pulse 120. Vomiting continued, she was unable to retain water or anything else. In the afternoon she had a chill with temperature of 103° F., pulse 128.

January 16th, temperature 103.6° F. at 4:30 p. m., patient vomiting, restless, delirious and very much dehydrated. January 17th, still restless and vomiting, proctoclysis started at 11:30 a. m. She was delirious and removed proctoclysis tube. At 5:30 p. m. venoclysis with 10 per cent glucose in normal saline begun. Patient vomiting profusely and complaining of pain over kidney regions. January 18th, venoclysis continued slowly. Vomiting less and dehydrated condition improved. Venoclysis was discontinued January 22nd after having been in operation for five days. Retention catheter introduced.

January 19th, patient not nearly so dehydrated as previously. Venoclysis with 5 per cent to 10 per cent glucose continued slowly. Temperature declining, no further vomiting. January 20th, temperature fluctuating, pain over both kidneys, dehydration not marked, no vomiting. January 22nd, venoclysis solution practically ceased flowing in afternoon, patient given solution by mouth and did not vomit. January 23rd, temperature normal, retention catheter in place. January 25th, temperature again rising, patient not taking fluids well, tenderness over both kidneys. January 27th, retention catheter removed, cystoscopic examination made in forenoon, temperature normal. January 31st, patient feeling much better, temperature normal. February 1st, temperature still normal, general condition improving. February 2nd, temperature normal, condition good.

February 3rd, condition greatly improved, temperature normal. February 4th, temperature normal for past seven days, patient dismissed and requested to return to obstetrical clinic.

Case III. C. H., male, admitted September 30th, died October 21st. The patient had been ill eighteen days with suppurative appendicitis when admitted. Operation was sought for relief of intestinal obstruction. He was seen and operated upon by Dr. Hume. The condition was such that nothing further than an enterostomy was attempted.

On October 10th, venoclysis with 10 per cent glucose in normal saline was begun be-

cause nutritional deficiencies became apparent. October 12th lobar pneumonia developed in left lung, on the 18th resolution occurred and on the 20th secondary intestinal obstruction took place and death ensued twenty-four hours later. The venoclysis was in continuous operation for twenty-five hours, and during that time he received 20,000 c. c. of 10 per cent glucose.

Case IV. J. S., male, admitted March 20th, 1928, because of avulsion of the left arm at the shoulder. He was semi-conscious, in profound shock, and was taken directly to the operating room. Venoclysis was begun immediately and continued during the operation which consisted of trimming and smoothing the ragged muscles and nerves and the formation of the flap.

The patient was dismissed April 8th, eighteen days after admission. He received in the first seventy-two hours 8,100 c. c. of 10 per cent glucose in normal saline, at the expiration of which time his condition was so much improved that we felt justified in discontinuing the treatment.

Case V. Mrs. L., referred by Dr. Hutcherson, admitted March 30th, died April 4th. On admission she was cold, pulseless, and unconscious. Her relatives gave the history that she had been ill for almost a year. During the last two weeks she had constant dysentery, bloody mucous stools, and vomiting. The fecal evacuations were involuntary. According to statement made by the family, no nourishment had been retained by the patient for a period of ten days. Venoclysis with 10 per cent glucose in saline was begun immediately. She regained consciousness, her pulse declined to 120, and prospects were rather hopeful for two days.

In ninety-six hours this patient received 11,000 c. c. of 10 per cent glucose. No diagnosis was ever made. She died an asthenic death.

I have used venoclysis in about thirty cases. The mortality has been high because it was used in cases apparently hopeless. No untoward effects have been noted in any case. By the use of this method I believe it is possible to keep the patient alive for at least ten days without any other means of nutrition. I have one patient who was kept alive for eight days by venoclysis. For the five days not even water was allowed by mouth. At the end of five days small amounts of water were given, and three days later he was permitted to have all the food required. This man was in desperate condition when operated upon for intestinal obstruction. Whenever the patient becomes acidotic or dehydrated in venoclysis we have an excellent method of introducing fluids. Of course it is of especial value in desperate cases where proctoclysis

cannot be used because the mucous membrane has lost its power of absorption. We are all doubtless familiar also with cases where fluids given by mouth failed of absorption for the same reason. Venoclysis is also indicated in severe infections where the patient's vitality is reduced to the point that no absorption occurs when fluids are introduced by proctoclysis or given by the mouth. By introducing fluid (glucose solution) into the vein it goes directly into the circulation, the patient is thereby nourished, dehydration is overcome, fever declines and the pulse improves.

I am not presenting anything new except the name of the procedure, but to complete the record I wish to exhibit the apparatus used in venoclysis. It is a very simple operation. An ordinary thermos bottle is used for the container and the attached rubber tube is about four feet long. The glucose solution is freshly prepared with sterile water and placed in the container at temperature of 120° F. The fluid loses about 5° for every foot of tubing and thus enters the vein at 100° F. The vein is opened and the small canula exhibited is fastened in place by a linen suture. The tube is then attached to the canula and the fluid started. The rate of flow is regulated by a stop cock. To preserve the temperature of the fluid I have found it advisable to use a stiff rubber tube which can be placed under the patient's body. When it is desired to raise the temperature of the patient, the fluid can be introduced into the vein at a higher temperature.

DISCUSSION

Virgil E. Simpson: As I listened to Dr. Hendon's report I wondered if the members of this society were fully alive to its significance. Spectacular mile posts set up to mark the progress of medicine arouse our enthusiasm, but the placing of an old procedure upon a scientific basis should enlist our earnest appreciation. The introduction of fluids and medicine into veins is a relatively old procedure but Dr. Hendon has brought to it refinements of almost startling simplicity. By his work at least two desiderata are accomplished. In the first accomplishment, he has devised a procedure whereby the temperature of the fluid can be regulated and maintained. Ordinarily a temperature of the fluid introduced equivalent to the body heat is desired and it can be accomplished by his use of the thermos bottle. But I see in it a solution of two other indications; a patient with a subnormal temperature from whatever cause may thus have his temperature raised to normal by introducing the fluid at a higher temperature than 98.6° F. much more quickly and certainly than by hot water bags, blankets, etc. On the other hand, a pyrexia may be definitely controlled, if fluid be also needed, by introducing at a temperature lower than normal. In the second place, he has

added to his device a means, also old, by which the rate of fluid introduction can be accurately controlled.

So much by way of commendation of what he has accomplished. Several things occurred to me while listening to his presentation which, if I may be permitted to offer as suggestions, will, I think make the procedure more scientific without making it unnecessarily difficult.

First. Glucose made by different chemical houses varies rather widely in strength. It will eventually be standardized but at present glucose is, at best, an uncertain term. To secure better uniformity, I would suggest that the product of some dependable concern be selected and used as each successive case presents itself and that chemically pure glucose always be specified.

Second. I would suggest the addition of Insulin to the glucose solution. Where acidosis exists it is certainly indicated for by its use the acid bodies can be more rapidly oxidized and symptoms eradicated. Even in cases without acidosis, I consider Insulin an advantageous addition. The patients for which this technique is indicated are in extremis; the ability of the tissue cells to digest and utilize glucose in such cases is, unquestionably an unknown factor, and, it is reasonable to assume, often lowered; the value of glucose in the fluid introduced by venoclysis is largely one of nutrition and its utilization is a matter of perenteral digestion. By the addition of Insulin the utilization of the glucose is made more definite; the buffer sugar need not be disturbed as Insulin should be used in amounts required to burn only the sugar introduced in the vein. As a working basis one unit of Insulin may be added to the solution to each two grams of glucose.

Third. I would suggest the addition of a thermometer to the apparatus. A thermometer of the type used on Basal Metabolism machines or a laboratory incubator could be inserted in the rubber stopper of the thermos bottle and the temperature of the fluid could thus be accurately determined throughout the administration.

Fourth. A water balance chart should be kept by the nurse as is done in nephritic conditions. The fluid intake by venoclysis should be recorded and the output by the kidney should be recorded each twenty-four hours. The amount of fluid the kidneys can eliminate is an unknown equation and it would be easily possible to overload them; edema of the renal structures would result and, in turn, water logging of the lung and other structures would ensue. There is another very important reason, I think, for keeping a water balance record and it concerns the heart. In ones eagerness to replace needed fluid a burden may be placed on a myocardium, perhaps, already damaged, which might result in dilatation and prove disastrous.

Fifth. A determination of the presence or absence of acidosis should be undertaken. This

can be done by one or all of three methods, two of which are simple and easily done while the other is more difficult but, by way of compensation, more accurate. The presence of acetone and diacetic acid in the urine can be done by any technician; an estimation of the CO_2 Alveolar Air content can be done in a few minutes, the apparatus is inexpensive and the procedure is a matter of almost common knowledge. The estimation of the CO_2 Combining power of the blood plasma is a highly technical procedure but is available in any considerable urban community.

Finally, I would urge the value of blood pressure readings at stated intervals during a venoclysis. In the introduction of a large quantity of fluid into the vascular system direct, such a record would be a helpful safe guard against over-load and stasis.

George A. Hendon, (in closing): I feel very grateful to Dr. Simpson for suggesting the various measures he has outlined. I am unfortunate in not possessing many of the facilities necessary for insuring perfection in certain scientific procedures. Everything Dr. Simpson said is deserving of consideration.

The idea of using glucose solution for the purpose of nutrition did not originate with me. Several years ago Dr. Matas, of New Orleans, published an article stating that he had introduced glucose through a duodenal tube into the intestinal tract and into the vein at the same time for a period of twenty-four hours with satisfactory results. That fact gave me courage to continue further efforts to perfect the plan upon which I had then been working for some time. I do not claim any originality for the procedure. There is a considerable amount of literature on the subject. Woodyatt, of Chicago, and others have been working along similar lines. However, the term venoclysis, so far as I am aware, had never been used until I applied the term to this procedure.

Three years ago I reported a case treated by venoclysis before the Southern Surgical Association, at Charleston, S. C., and was greatly amused by the statements made in the discussion about the difficulty of keeping the glucose solution warm. Someone at the time presented an electrical apparatus to be placed around the tube to preserve the temperature balance. The simplest way in the world to keep the solution warm is to use thick stethoscopic tubing which can be passed under the patient's body without compression. The fluid can be introduced into the vein at any temperature desired. I use an ordinary thermos bottle as container for the solution, but something better may be suggested in the future. Everything used in venoclysis can be sterilized by boiling except the thermos bottle, that is carefully cleansed by rinsing with hot water before being filled with glucose solution.

When the bottle is not in use I keep it filled with Dakin's solution.

Dr. Simpson is correct in stating that venoclysis is especially adapted for raising the body temperature when subnormal. It is a simple procedure and more effective than hot water bottles and other devices externally applied. My plan has been to place the solution into the container at temperature of 120°F. , it then reaches the vein at 100°F. A temperature in the vein at 120° may be used if indicated.

In regard to the water balance. This is sometimes rather difficult to figure. For instance, in one of the cases reported the patient voided only 160 c. c. of urine in twenty-four hours, yet she received during the same period 4000 c. c. of glucose solution. If there is any over-accumulation of fluid in the system it is announced by characteristic symptoms. If the slightest edema occurs under the eyes, it is a warning to discontinue the introduction of fluid.

As Dr. Simpson says, the heart deserves special consideration, but when it is remembered that the patient is receiving fluid in no other way than by venoclysis, that there is no distribution of fluid through the intestines, the heart burden is not as great as would appear at first. However, as a matter of precaution we always try to protect the heart by the administration of digitalis.

The range of usefulness of this method and the territory it covers is so varied that it is absolutely overwhelming to think about what can be done.

Removal of Primary Carcinoma of Liver.—

The tumor in Hicks' case was the size of an orange, originating from the left side of the liver. A band of cirrhosis, 2 inches wide, was present, running backward through the mesial side of the left lobe. From and in this cirrotic band the tumor arose. A careful abdominal examination did not reveal any other lesion. The growth was excised by sharp dissection, the cut surface being sewed as cut with an interlocking double catgut suture, drawn as tightly as possible without causing cutting. Three or four vessels required separate ligation. A rubber glove was spread out over the raw surface for tamponage and drainage. The usual abdominal closure followed. All the drain was out by the fourth day, and the patient left the hospital in thirteen days. The inspection of the gross specimen showed an encapsulated tumor with some central degeneration. Microscopically the tumor proved to be a carcinoma. The patient did well for three months. Then he showed slight icterus, but his appetite was good and there was no pain. Two months later he had some pain requiring anodynes and had an occasional hematemesis. He died six months after the operation.

RECURRENT MESENTERIC CYST:
CASE REPORT*

By J. DUFFY HANCOCK, B. S., M. D., Louisville

Mesenteric cysts are generally considered to be among the most rare of surgical conditions. This was impressed upon us by our search of the records of St. Joseph's Infirmary and those of the Louisville City Hospital. At St. Joseph's we were able to find record of but one case, that in a child. At the City Hospital also we were able to find but one recorded. Granting that the records were not well indexed until the last 5 or 6 years, we have even then but 2 in perhaps 10,000 surgical admissions. This rarity together with the debate that has raged in regard to the origin of these cysts makes their study an interesting one and leads us to report the following case. The final pathological report seems to sustain the contention of Dowd that these cysts result from embryonic sequestration.

In July, 1926, I was called to see E. W., white, widow, 47 years of age, who until two weeks previously had been working as an actress. Her complaint was pain and a growth in the upper left portion of the abdomen, first noticed nine months previously. In the beginning there had been indefinite indigestion and vomiting and since then the tumor and "weighty feeling" in the abdomen had persisted. She belched frequently and when the stomach was full was considerably nauseated. During the past two weeks the increased severity of the symptoms had confined her to bed. Her normal appetite was gone, there was continual tenderness and soreness in the left upper quadrant where the mass was and occasionally there were sharp pains. There was decided constipation. She had some difficulty in breathing when she would lie down because of the pressure. At times there was slight burning on urination, but the appearance of the urine was normal. She was extremely nervous because of her condition. Past history negative except for typhoid fever at age of 6 years. Menstruation was still normal and regular. She had two children, both in good health. Family history negative. Examination showed that she was well developed and well nourished, but evidently in pain and weakened physically. Head and neck normal except for impaired hearing. Heart negative except for some muffling of the sounds; rate 78. Lungs normal throughout. Expansion on left side unimpaired. Abdominal examination showed a rounded mass about 5 inches in diameter located in the left upper quadrant. It was apparently well encapsulated, fairly movable and not notched. It could be displaced downwards

and the examiner's hand inserted between it and the left costal margin. The mass was not particularly tender and seemed to be more in the abdomen than in the loin. Abdomen otherwise negative. Pelvic examination showed relaxed perineum but healthy cervix, fundus normal in size and position, and no enlargement of tubes or ovaries. Urine examination negative. No sugar, albumin, blood or pus. Blood count showed hemoglobin 80%, erythrocytes 4,000,000, leucocytes 8,250; polymorphonuclears 72%, and lymphocytes 28%. X-ray examination showed smooth contour of stomach and normal duodenal cap, but stomach cavity compressed in size at central portion probably from extragastric tumor. Urine obtained by catheterization of left ureter showed amorphous urates and a few epithelial cells, but no pus, bacteria, casts or erythrocytes. Fifteen minutes intravenous phenolsulphonephthalein test resulted in 4% output from left kidney. While the phthalein test was not entirely satisfactory we felt that the microscopical examination of the urine from the ureter plus the physical examination were sufficient to exclude the kidney from consideration. Pelvic examination eliminated ovarian cyst. Splenic disease seemed excluded by normal blood count and absence of notches on tumor. Absence of fever led us not to expect pus. A diagnosis, therefore, was made of intra-abdominal cyst of undetermined origin.

At operation, at the Clark County Memorial Hospital in Jeffersonville, Ind., on July 17th, 1926, the following findings and operative procedure were recorded. Findings:—Peritoneal cavity contained a fairly large amount of clear thin straw-colored fluid. Ruptured cyst wall found to be very firmly attached to transverse mesocolon near splenic flexure. The cyst had evidently been larger than an ordinary sized grapefruit and had been in left upper quadrant. The spleen and stomach were normal. Neither kidney was enlarged. Procedure:—5-inch high left rectus incision. Abdomen explored. Fluid sponged from abdominal cavity. Interior of sac was packed with two strips of gauze and sac edges sutured to peritoneal edges as it seemed that removal of the sac might impair the blood supply of the transverse colon. One rubber tissue drain placed in abdominal cavity besides the sac and abdominal wound closed in layers with plain No. 1 and chromic No. 2 catgut and three silk worm gut stay sutures. A rather uneventful recovery was made and the patient left the hospital on August 3rd, 1926, in good general condition with operative wound clean and

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(Note.—The patient told me later that she felt the cyst rupture when she was being lifted from stretcher to operating table but thought she had better continue with operation and say nothing about it at that time.

healed except at site of small draining sinus. This soon healed and she resumed active life but was never entirely free of pain and tenderness at site of scar.

In April, 1928, I was again called to see her and her complaint this time was nausea, "tightness" across upper part of abdomen and pain boring through to the back. She stated that after eating beans, homebrew and chocolate soda she had an attack of "indigestion" and had considerable gas. The following day she had very acute pains (of colicky nature) throughout upper abdomen, relieved by opiate. Has had two to three vomiting spells per day and felt constantly nauseated. After each effort to take food, she stated that she had great deal of gas and pain. No jaundice. Fecal evacuation twenty-four hours ago. Had one degree of fever three days ago. So far as her head, neck and general condition were concerned there was no change from previous time. Pelvic examination was negative as before. Abdominal findings were, however, somewhat changed. The entire abdomen was distended moderately and rigid across the upper part where there was considerable generalized tenderness which was perhaps most marked below and to the left of the ensiform process. The scar of previous laparotomy was slightly puckered at the lower angle and the entire scar seemed sensitive to touch. There were no evidences of any mass present in the abdominal cavity as there were at the time of the other operation. At the time of the examination she was observed during a very bad attack of colicky pain, which seemed to resemble the intermittent pain of intestinal obstruction with the exception that the gas and fecal flow could be felt and heard gurgle past the occluded place as patient was relieved of this particular pain. The obstruction was evidently not complete as was shown by the relief just described. Laboratory findings were as follows:

X-ray examination, April 13, 1928. Examination of the colon with barium enema showed considerable irregularity of the colon in the region of the splenic flexure and upper part of the descending colon. There was considerable delay in the passage of the barium through the splenic flexure but no marked obstruction. The remaining portions of the colon filled promptly. There was considerable dilation of the cecum and descending colon; also of the rectum. Flat plate of the abdomen showed no evidence of renal calculi or gall stones.

Urinalysis, April 14, 1928. Color, reddish brown turbid; specific gravity, 1.021; reaction-acid; sugar and albumin, negative; acetone, negative; trace of indican.

Microscopical examination shows epithelial cells; rest of field obscured by erythrocytes

(patient had just finished menstruating).

Blood count, April 13, 1928. Hemoglobin 73%, erythrocytes 3,489,000, leucocytes 11,600. Differential count: Polymorphonuclears 77.5 %, small lymphocytes 21.5%, large lymphocytes 1%.

In view of the fact that no mass was palpable a diagnosis was made of post-operative adhesions causing incomplete obstruction. Operation at St. Joseph's Infirmary on April 18, 1928, resulted in the following findings and procedure. Findings:—There were a few adhesions which, however, could cause no diminution in the calibre of the transverse or descending colon. In the mesentery of the transverse colon, however, there was a cyst about the size of a grapefruit which cyst was connected to the peritoneum at site of the old scar by a very firm fibrous band, probably the remains of the cyst sac which had previously been sutured to the peritoneal edge of the wound. Inner and outer surfaces of sac smooth. The gall-bladder was negative to palpation. Procedure:—Scar of previous operation on left upper quadrant was excised. The fibrous band from the cyst to the peritoneum was divided and the cyst was fairly readily enucleated as it was not so adherent in the mesentery as had formerly been the case. There was a fairly good line of cleavage and the cyst was practically entirely freed when it was ruptured, in one place releasing a small amount of its contents which were of a dark brown fairly thick liquid nature. The rent in the mesentery was sutured and a rubber tissue drain was placed between the two layers of mesentery and brought out through the gastro-colic omentum. Abdominal wound closed in layers of plain and chromic catgut. One rubber tissue drain placed between the skin and the muscle fascia. The pathological report stated that the specimen consists of cyst, 110x70x15 mm. Surface is pinkish red. Wall is grayish, thickened and friable. Inner surface is reddish brown somewhat necrotic looking. Microscopic description:—Two sets of sections show diffuse fibrous tissue with necrosis, congestion, hemorrhage, and marked reaction of leucocytes, chiefly lymphocytes, although endothelials are numerous, mostly filled with brownish granular pigment. There are some scattered polymorphonuclears, also fairly numerous eosinophiles in some places. Scattered through the sections are two types of glandular structures, one is lined with single layer of columnar epithelium and look like cross sections of ducts with marked reaction of polymorphonuclears and round cells within and around. Elsewhere are clumps of glands suggesting pancreatic alveoli, but these are atypical and often present solid masses of small epithelial cells with definite hyperchromatic, round to oval nuclei. There are scattered mitoses fairly numerous.

Microscopical diagnosis: — Adenocarcinoma; subacute and chronic inflammation.

Note: Alveolar structures suggest pancreatic origin, but this is not definite.

The patient left the hospital on the 11th day in fairly good general condition and with the abdominal wound healed except at drainage site.

At first I was surprised at the pathological report but am more disposed to accept it now. Her wound has healed nicely, but she still has attacks of nausea and vomiting and frequently there is severe pain boring forward from the back through the abdomen. She has not regained her strength as she should and I am much concerned about her future.

DISCUSSION

R. P. Ball: Before showing sections of the cyst wall of this interesting specimen I shall tell you how it looked in its gross form. The cyst wall averaged 5 mm. in thickness. The inner surface, after fixation in formalin, had an ochre color and was slightly irregular.

These sections were taken from various portions of the wall of the cyst. In this first slide you can see the epithelial structure present. The cells are arranged in acinar formation with a small, or indistinguishable lumen. The cells are cuboidal in shape. They have a fairly abundant cytoplasm and a large, round, vesicular type of nucleus. In this same field you can see an entirely different structure. Here is a large tubular formation lined with columnar epithelium. The nuclei are located at the base of the cells and are round and deeply stained. The stroma, which is fairly abundant, is a loosely arranged, fibrous type. In some areas you will note the granulation tissue which is infiltrated with varying number and types of leucocytes. Many endothelial leucocytes are present and some contain hemosiderin.

In this slide you see a new formation present. Here are groups of epithelial-like structures arranged in a syncytial mass with small, round, deep staining nuclei. This structure very closely resembles an island of Langerhan.

This slide offers an explanation of the cyst refilling with fluid. You can see the lining is composed of a tall columnar epithelium. It is presumed these cells had the secretory property to provide the fluid present. I shall not take your time to show more slides which would, in a way, repeat what has been shown.

That this cyst is not of parasitic origin we have shown by sections of its wall. That leaves four accepted types of mesenteric cysts. (1) chylous; (2) enteric; (3) urogenital; and, (4) cysts of unknown epithelial origin. The epithelial structures present would go a long way to eliminate the chylous cyst. In this type we find an endothelial lining cell rather than columnar type. The fluid was straw colored when first opened, rather than milky. The location of

the cyst does not favor enteric origin since they are usually in the mesentery of the small intestine and near Meckel's diverticulum. The type of epithelial cells present would not suggest urogenital origin. However, the Mullerian duct could give rise to the columnar epithelium. This cannot be ruled out. The acinar formation with ducts and structures suggesting islands of Langerhan, suggests pancreatic origin.

Our explanation for such a lesion is problematical and yet it is the most logical. A group of cells early in the development of the fetus and at an early stage of differentiation, becomes displaced due to inclusion by adjacent cells and is carried to any region of the body. This undifferentiated group of cells will atrophy, remain quiescent or later in life proliferate. When they begin proliferation the resulting lesion will be dependent upon the predominant function of the proliferating cells.

Apparently in this case it was a secretory product of the lining cells of the cyst. Due to its location and to the type of cells present I believe it is of pancreatic origin; not necessarily connected with the pancreas, but arising from cells which are from the pancreas anlage.

J. Garland Sherrill: I wish to congratulate Dr. Hancock and Dr. Ball on their beautiful presentation which shows that there is some really scientific work being done here at present. Dr. Hancock referred to my book on The Peritoneum: When investigating the subject of cysts of the pancreas and mesentery I did so with the view of obtaining information concerning peritonitis. I was surprised to find a very small amount of literature on record at the time, and that the formation of these cysts did not seem to be well understood by men writing on the subject, and I confess that I understood it less.

Mesenteric cysts develop inside the folds of the mesentery or in the retroperitoneal tissues. It may be readily understood if there are cell rests glandular in type with epithelial tissue inside, a type of cyst is formed having an epithelial lining. That is the most frequent type of mesenteric cyst. If the cell rests are endothelial in type, then the cyst will be lined with endothelial cells. The endothelial type is a thin-walled cyst and ruptures very easily.

There is a question whether or not there is a pancreatic element in the formation of these cysts, and how much mucous tissue there may be present. A cyst developing from a mucous gland would show the same type as a pancreatic cyst. I have seen cysts of the pancreas and watched their development and have operated upon them. Very few cysts of the mesentery have come under my care, except simple cysts which do not have a lining of epithelium. It has been contended by some authorities that these are always wandering cysts originally developing in the region of the ovary from remains of the Wolffian body.

There is another type, the so-called chylous cysts, which develop in the mesentery and rupture of these cysts produce ascites.

There develop in the mesentery glandular cysts, chylous cysts, and schinococcus cysts. Fortunately these conditions are rare. The diagnosis is seldom made prior to the time of operation. Dr. Hancock is to be congratulated on the masterly manner in which he handled the case reported. It was the proper procedure to drain and allow the patient to recover before doing anything else. Then in the event of recurrence the cyst is easily removed by dividing the mesentery and pushing it to one side. Dr. Hancock was wise in not destroying the blood supply to the colon at his first operation. Had he done so thrombosis of the mesentery vessels and death of the patient would most likely have been the outcome.

CAVERNOUS NEVUS OF THIGH AND LOIN*

By J. GARLAND SHERRILL, A. M., M. D., F. A. C. S., Louisville.

The main reason for requesting the patient, Mr. H. B. G., aged 37, to appear before you, is to obtain some information. He has a rather interesting history.

The patient was never strong as a child. He had influenza two years ago, and following that his general health did not improve, he suffered from pain in the occiput due to frontal sinus disease. Tonsillectomy was performed one year ago. Some time after he developed sinus trouble, he was operated upon by Dr. Gaylord C. Hall. That was in March, 1926. Headache had been severe for two years, but has been less since the sinus operation.

There has been more or less pain in his right side for some time. He came to me about three months ago with an acute attack of sharp pain in the right iliac region, nausea and vomiting, but no fever. He complained of constant soreness in the right side and was constipated. Appetite fair. The acute attack was diagnosed as appendicitis. He also had a recurrent fibroma of the right forearm. Appendectomy was performed. The pathological report showed chronic appendicitis; wall considerably thickened and fibrous; moderate round cell reaction. The leucocytes count at that time was 10,200 with 96 per cent polymorphonuclear cells.

At the time of the operation, the patient said he had "some small lumps on his thigh" which he asked me to examine while he was under the anesthetic. However, I mistook the place about which he was talking. It seems he had reference to the right hip. A few small varicosities were found on the lower

outer aspect of his thigh which were ligated and removed.

The patient recently returned complaining of pain in his back just above the sacroiliac junction, and there was a soft swelling at that point. The question arose whether he might not have some trouble with his spine. Roentgen-ray films made anteroposteriorly and laterally show no signs of bone pathology.

The swelling was tapped on two occasions and only blood obtained. When operated upon for appendicitis he did not have the bluish-purple mass in the upper part of the thigh which is now present, and which to my mind is a cavernous nevus that is evidently increasing in size.

There is nothing of importance in his family history. Father, mother, and one sister, living and in good health. No tuberculosis and no specific history.

The reason for inserting a needle into the mass was that I wanted to be sure, on account of the pain, that we were not dealing with an abscess. When he was seen in December this tumor was not evident. I take it this must be a cavernous nevus springing from the bone and probably also extending into the pelvis. I have seen some nevi that showed a tendency to enlarge. If it were a sarcoma there would evidently be more bone complications.

DISCUSSION

William J. Young: There are two types of angioma ordinarily seen clinically. First, angioma vascularis which is superficial and commonly known as "port wine stain;" second, angioma cavernosum in which the deeper blood vessels are involved. In angioma vascularis, unless the lesion attains a size greater than a silver half dollar, no treatment is instituted, because by irritating the tissue we further predispose the case to development of malignancy at a later date. That is a lesson I learned from experience, and have heard several others express a similar opinion.

In angioma cavernosum splendid results have been secured from radium and the roentgen-ray. Ordinarily angioma cavernosum is noted during the first six months of life. The lesion may occur on any portion of the body. The family physician nearly always tells the mother, if the child has an angioma cavernosum the size of a match head, that it is better to wait six months and see what will happen. Only one of two things can happen, viz.: the lesion becomes larger, or remains stationary. There can probably be no greater injustice done the helpless patient than by such advice from the attending physician. I have seen numbers of angioma cavernosa which appeared primarily as pin-point lesions become as large as pigeon eggs through the parents accepting and following such advice. These lesions are readily resolved by radium treatment, with a resulting tissue-paper scar,

*Read before the Louisville Medico-Chirurgical Society.

which is permanent and due both to thinning of the tissue and action of radium on the lesion.

The simple angioma, or port wine stain, sometimes fades and disappears, but angioma cavernosum either gets larger or remains the same size. The only proper procedure is to treat the latter type immediately.

The lesion in Dr. Sherrill's case is of totally different type from either of those I have mentioned. It appears to be an angioma cavernosum which developed at a later date than ordinarily observed. I am free to confess that I have never treated such a case, but a favorable result might be secured with filtered roentgen-ray or radium. This form of treatment would cause constriction of the lumina of the veins, and I would be glad to undertake the treatment of this case to determine what result could be obtained. I do not see why we should not produce constriction of the blood vessels, unless they are too large. The lesion is due to over-dilatation of the veins the same as in simple varicose veins in the lower extremities.

By using 100 milligrams of radium for eight hours at one and a half inches distance, I believe sufficient constriction of the lumina of the involved blood vessels could be secured to be of great benefit to the patient.

John W. Price: I do not know that I can add very much to the discussion, but it seems to me that the lesion in the case before us is an angioma cavernosum. The deeper veins are involved and have become large blood sinuses probably with multiple communications between them.

I hope Dr. Young's proposition to treat this patient will be accepted. I would suggest that radium be used, and if it proves successful it will avoid massive dissection of the tumor. I presume Dr. Sherrill will consider the latter method in the event radium is unsuccessful.

J. Garland Sherrill, (in closing): I thank the gentlemen for their discussion. The surprising feature to me is, with the limited growth of the tumor, the patient should have such a great amount of pain. My experience with angiomata is that they cause very little pain as a rule.

I recall having removed from a baseball player a very massive hemangioma of the buttock which developed after adult life. This was due to traumatism in "sliding to base" in playing baseball. The growth was very large, but I was young and enthusiastic and removed it. Fortunately the patient recovered. He had only slight discomfort and minimal pain from presence of the tumor. The entire angiomatous growth apparently communicated directly with large veins.

The case before us seems to be of different character. The most cavernous angiomata coming under my observation have not progressed very rapidly in size unless there was a mixture of sarcomatous elements present. There is

usually very little pain until the bone becomes eroded. If the lesion in the present case were sarcomatous, erosion of the bone would have occurred, especially as it lies under the fascia and presses on the roots of the nerves that emerge from the sacral region.

I do not believe I shall attempt to remove this tumor. If it has grown to that extent that it involves the spine, it must also invade the abdominal cavity. In performing appendicectomy upon this patient I did not explore the abdomen. Rectal examination might throw some light on the case.

A number of years ago Wyeth (New York) used hot water injections with considerable satisfaction in the treatment of cavernous angiomata and lymphangiomata. I have employed that method in one or two instances and saw no ill-effects although it was not entirely successful. I would be inclined to think the use of hot water in tumors this type might be followed by embolism, therefore I would consider it a dangerous procedure. We might use electrocoagulation and hope by that means so accomplish something for the patient. However, I would prefer to have Dr. Young institute the treatment he has suggested. I do not believe radium could do any great amount of injury, and it might cause enough fibrous reaction to constrict the vessels, and there is a possibility of some good being accomplished. I will confer with the family physician and ascertain his views on the subject. If radium offers anything I am inclined to recommend it. If the patient had no pain I would favor letting the growth alone. The majority of cavernous nevi cause little discomfort. In cirroid angioma of a vein underneath a nerve, naturally there would be increase in size and great pain. Such a condition would be much more serious than a simple nevus.

Hemolytic Serotherapy of Multiple Sclerosis—

Laignel-Lavastine and Kossios report eleven cases of multiple sclerosis treated with a serum that was prepared by inoculation of rabbits with the erythrocytes and the cerebrospinal fluid of patients with multiple sclerosis, and thus, theoretically, contained anti-bodies for multiple sclerosis. They observed general and local reactions in all patients during the first day of two after the administration of the serum; rise of temperature to 39 C. (102.2 F.), cephalalgia, slight transient anemia, various degrees of hemolysis (icterus), incontinence or retention of urine, and a feeling of heaviness in the legs, sometimes with paraplegia. Then, in a few days, there was transient or permanent disappearance of the rigidity and the contractions of the legs, of trembling, of clonus and of nystagmus, with a return of the muscular strength and decrease of fatigue. The best results, up to a complete cure, were observed in comparatively early cases of multiple sclerosis.

A CASE OF PUERPERAL INFECTION*

By HARRY A. DAVIDSON, M. D., Louisville.

Patient, Mrs. E. G., aged 20, the wife of a mining engineer from a mining town in Illinois, was first seen by me in her early months of pregnancy. She was examined physically, and pelvimetric measurements were made which were found to be normal. She was treated for two or three weeks for nausea of pregnancy and responded readily to the treatment.

She returned to her home in Illinois and was delivered in the mining hospital, January 22nd, 1928, of a healthy, living girl. The nurse who was with her at the time of delivery, and who brought her to Louisville on March 7th, 1928, gave the following history:

After an average labor she was delivered without instruments of an average sized girl baby with a vertex presentation. She had a rather severe hemorrhage after delivery. On the fourth day postpartum her temperature rose to 105° F. accompanied by a chill. Thereafter her temperature every day was as high as 105° or 106° F. with rapid pulse. The attending obstetrician had two blood cultures made both of which were negative. The patient developed an abscess near the lower spine which was incised and drained.

Three weeks post-partum she developed pain in the left axilla and a swelling appeared in that region which slowly became larger. This was not incised by the attending physician. The nurse stated there were one or two other infected cases in the hospital at the same time. The patient seemed to be going from bad to worse, and finally her mother decided to bring her to Louisville.

On the morning of March 7th, 1928, I was asked to see the patient at her mother's residence, and Dr. Edward Speidel was also called in consultation. After obtaining her history and making a physical examination, we had the patient removed to the Norton Infirmary.

We were somewhat surprised to find her pelvic organs in apparently normal condition. We examined her body from head to feet and could find very little pathology to account for her serious illness, excepting a large abscess in the left axilla. After carefully examining her lungs, we decided that the abscess was external to the pleural cavity, and this was later confirmed by roentgen-ray investigation.

On March 8th 1928, under local anesthesia, we incised the abscess, evacuated a large quantity of pus, introduced a drain and applied sterile dressings. Her temperature was

104° F., pulse 132, and respirations 26, at that time. The temperature receded to 99° F. the next morning, but again rose to 103.8° F. the next evening, and continued to range from normal to 103°-102°-101° F. for many days.

Blood examination on March 7th, 1928, showed: hemoglobin 50 per cent, erythrocytes 2,640,000, leucocytes 10,500; differential, polymorphonuclears 79 per cent, lymphocytes 18 per cent, endothelial leucocytes 2 per cent, and basophiles 1 per cent. The urine showed albumin one-plus, sugar none, pus cells 50 to 75 per high power field.

A blood culture was made and was negative after twenty-four and seventy-two hours. A culture made from pus obtained from the axillary abscess showed streptococcus hemolyticus, and an autogenous vaccine was made from this germ. A catheterized specimen of urine later showed pus, and the vesical cavity was irrigated and argyrol solution introduced. Marked improvement in the condition of the urine promptly followed.

The treatment instituted was about as follows: drain in abscess cavity changed at intervals; vaginal douches of lysol solution each day; increasing doses of autogenous vaccine every four days; ferruginous ampoule intramuscularly each day; nourishing, easily digested food, including liver, once daily; fresh air; sunshine; proper attention to renal and intestinal functions; ice-cap to head when temperature high; alcohol baths, etc.

On April 6th, 1928, it having been determined that there was a pocket of pus five or six inches from the original opening which could not drain satisfactorily, another incision was made under local anesthesia, and a drain inserted at the lowest point. The next day her temperature receded to 98° F. and never rose above 100° F. thereafter.

The patient became stronger every day, the pulse slower, and respirations normal. She was sent home May 25th, 1928, very much improved. The blood count at that time showed: erythrocytes 4,000,000, leucocytes 5,000; differential, polymorphonuclears 71 per cent. The drain was removed and the wound healed rapidly. The tonic treatment was continued after she went home, and within about three weeks she was apparently in normal condition.

In August, 1928, number of the American Journal of Obstetrics and Gynecology, appears a very remarkable account of an outbreak of puerperal sepsis in the Sloane Maternity Hospital, New York City. The hemolytic streptococcus was found to be the causative agent, and the noses and throats of the doctors, nurses and attendants were the sources of the infection. Such cases may appear in the best regulated hospitals. Eternal

*Read before the Jefferson County Medical Society.

vigilance against infection is the price of life and health for the obstetric patient.

DISCUSSION

Edward Speidel: I saw the patient with Dr. Davidson as he has stated. She presented the typical appearance of sepsis. After discovering the axillary abscess we concluded we were dealing with a case of pyemia and thought by incising and draining the abscess we would benefit the patient to that extent at least. A peculiar feature of pyemia is that in those patients who have large localized abscesses the prognosis seems to be more favorable than in cases where abscesses do not occur.

From the history given us by the nurse, we had reason to believe that the patient was properly delivered and that the source of infection probably was the presence in the mining hospital of other cases of infection. She undoubtedly must have had a severe streptococcal infection judging from the rise of temperature during the course of the disease.

The blood examination, as so often happens in these cases was negative. This may be true for several reasons. It is my understanding that the blood is likely to be negative unless a specimen is obtained for examination immediately after a severe chill. Moreover, several blood examinations may have to be made before the offending organisms can be found. Consequently, as a rule, the diagnosis must be based on the clinical symptoms and history.

In regard to the treatment: I was associated with Dr. Davidson throughout. It was his suggestion that autogenous vaccine be prepared from the axillary pus and administered. It seemed to answer the purpose very well. In addition the patient's room faced the south so she had sunlight and fresh air the entire day. This was probably of considerable benefit.

Concerning the epidemic occurring in the Sloane Maternity Hospital, New York, mentioned by Dr. Davidson: This may throw some light on the cause of puerperal infection and shows that such cases may occur at any time. I believe, especially during the winter months when colds and sneezing are prevalent, it would be wise for doctors and nurses in obstetrical cases to wear complete masks covering both nose and mouth.

In the treatment of these cases in the Sloane Maternity, they used what is known as the new anti-streptococcal serum. This is a concentrated serum made by a responsible drug house in which 10 c. c. is equivalent to 100 c. c. of the old serum. Ten c. c. of this new serum is given at a dose at proper intervals, and 5 grs. intravenously or intramuscularly, in sterile solution of hydrochlorate of quinine. In addition blood transfusions were used every few days in their endeavor to effect a cure.

In the Sloane Maternity of 160 patients, delivered in January and February, 1928, 25 de-

veloped severe puerperal infection and of these nine died despite the extreme precautions taken in that hospital. The lesson taught by this epidemic is that we must make closer study of our hospital cases in order to prevent such an epidemic.

S. H. Starr: I understood Dr. Davidson to say the pelvic organs were in normal condition at the time he examined the patient. It is interesting to note that the cases of puerperal infection that are most severe are those which occur early after delivery. The infection extends through the uterine vessels without localizing in any certain portion of the body until later, when abscess formation may occur.

So far as the treatment is concerned, it would be interesting to know what was done before the first abscess developed, that is while the patient was in the mining hospital.

Some observers who have used anti-streptococcal serum claim they have secured no beneficial results, while others seem to think it is an excellent method of treatment. Bailey is especially enthusiastic about this method of treatment.

When the epidemic of puerperal infection occurred in the Sloane Maternity hospital, in order to check it, the building had to be closed for a week and thoroughly fumigated. I do not believe the specific organism has been found which is responsible for the infection in these cases. Examination showed the presence of a type of hemolytic streptococcus, but they have not found the specific one.

George A. Hendon: Taking a more comprehensive view than that which was indicated by the essay, we must recognize the fact that we have only three ways of combating infections, whatever their source may be. First, the antidote, second, elimination, third, dilution.

We have no reliable antidote for the majority of toxins, elimination can only be achieved in a fraction of the cases involved, but it is always possible to dilute a toxin, and this dilution can be carried to the degree of innocuous attenuation. This can always be accomplished by an abundance of fluid introduced directly into a blood vessel by a process which we are pleased to call Venoclysis. The fluid used should be one that is tonic, isomeric with the blood. The term Venoclysis indicates the instillation of fluid at a rate that is commensurate with the vital absorbing powers. I have given in a case of blood stream infection, 6000 c. c's. of a 10 per cent solution of dextrose with a continuous supply within a period of 18 hours. Ringer's solution or Fisher's solution or normal saline may be used, as the judgment of the physician may indicate.

I have devised a cannula and a method by which this continuous administration of fluid into the vein has been kept up over periods of from 12 hours to 254 hours without cessation and with astonishing benefit.

In a case such as that presented by Dr. Davidson, I would be in favor of using dextrose 10 per cent solution in preference to any other, because the dextrose not only furnishes nutrition but seems to me to have some antitoxic properties.

I have seen some very remarkable effects following this method of treatment, particularly in blood stream infections. I wish to emphasize the fact that venoclysis offers a means by which one may meet the requirements of dilution in the most ideal manner. Whether the excess of fluid drowns the organism or dilutes the toxine is not clear. At any rate dehydration, acidosis and toxæmia seem to yield with uniform regularity to its effects.

Harry A. Davidson, (in closing): Dr. Speidel mentioned the treatment that was instituted in the epidemic of puerperal infection that occurred in the Sloane Maternity Hospital. It was somewhat different from the treatment we used, but I do not believe they secured any better results, if as good, as we did.

Dr. Starr asked what had been done for the patient before we saw her. As stated in my report, she was delivered in a mining hospital in Illinois and we did not see her until six weeks later when she was brought to Louisville. The nurse who came with her said the physician did very little, and that was one reason the parents wanted to get the patient away from the mining hospital and bring her to Louisville. Why the physician did not incise the large axillary abscess which had been present for three weeks I do not know. The nurse said there were other cases of infection in the hospital at the time, no doubt the doctor was worried and upset mentally, and did not know just what to do.

The points mentioned in the discussion are interesting. You will remember I stated, in giving the history, that this patient had a severe hemorrhage soon after delivery, which of course, lowered her vitality and I think was one of the main causative factors of her infection. We know that during delivery every woman, and especially if she be a primipara, is more or less traumatized, and there is always danger of the introduction of germs into these minute wounds.

This patient had a severe hemorrhage which lowered her vitality, some hemolytic streptocci were present in the blood stream, she had one abscess in the lower spinal region which was opened, and later she developed the large axillary abscess that I described. The fact that she had these localized abscesses was really in her favor, as mentioned by Dr. Speidel. It is a known fact that patients having pyemia, with localized abscesses are more likely to recover than those who do not, because, they manufacture their own antitoxin or vaccine. That was the reason why we thought autogenous vaccine made from pus evacuated from the axillary abscess would be beneficial in the case reported. Rest in bed,

nutritious food, fresh air, sunshine, general supportive treatment—that is really the best method of treatment in infections of this kind.

The cases occurring at Sloane Maternity Hospital were mentioned because I believe there are one or two important lessons to be learned from them. There were 160 patients in the hospital at the time, 15 per cent of them became infected, and 33 per cent of those infected died, a fearful mortality. Many investigations were made in an effort to determine the cause of the epidemic, and I believe it was finally decided that the streptococcus hemolyticus was responsible for the infection, but they did not determine exactly who was the "guilty party,"—it may have been a doctor, a nurse or an attendant, as several of them had streptococcus hemolyticus in discharges from the nose and throat. There is an important lesson to be learned from this: heretofore at the Sloane Maternity all doctors and attendants were required to wear masks covering the mouth but not the nose; since the epidemic a rule has been issued that every doctor, nurse and attendant in the delivery room, and also in the operating room, shall wear masks completely covering both nose and mouth, especially during the winter months when colds are so prevalent.

The circumstances cited exemplify what was said by Oliver Wendell Holmes in this country and poor Professor Semmelweis in Europe seventy-five years ago. I say "poor Professor Semmelweis," because he finally landed in an insane asylum, worried himself to death, trying to impress the medical profession with the fact that women in labor were often infected by the doctor or attendant. The idea was ridiculed at that time, but it was later proven true that pregnant women were not infrequently infected by doctors and attendants by examinations during or prior to labor. The edict was then issued that every precaution be taken to prevent infection and this should be impressed upon doctors, nurses and attendants. The importance of this advice is now well understood. We should take every precaution to prevent infection of the lying-in woman, such as the application of mercurochrome, iodine solution, etc., just as is done in the operating room before an abdominal operation. If the same precautions are taken in the delivery room as for an abdominal section we will not have so many infections during labor. Nearly every woman who is delivered is more or less traumatized, germs are always in evidence, many germs are present in the vagina at the time of delivery, on the skin surface, etc. So I think one of the main points in preventing infection is to have the field, including the surrounding skin, the vulva and vagina, as absolutely germ proof as possible. That is the reason I am a great believer in the use of mercurochrome in a 4 per cent solution applied over the field and even in the vagina.

MECKEL'S DIVERTICULUM: DIVERTICULECTOMY*

By GUY P. GRIGSBY, M. D., F. A. C. S.
Louisville.

Meckel's diverticulum is nothing new. Pouches of various sizes projecting from the walls of the intestine were recognized in the seventeenth century. The particular type under discussion, however, which involves the terminal ileal segment, does not appear to have been carefully studied and accurately described anatomically until the advent of Meckel many years later. He determined that the anomalous development was congenital, being an unobliterated remnant of the omphalo-mesenteric or vitelline duct which in fetal life represented the communication between the yolk-sac and the primitive digestive tube.

The diverticulum is generally an incidental finding, during surgical procedure for some other lesion of the intra-abdominal viscera, or at necropsy. It is estimated that Meckel's diverticulum is present in between one and two per cent of human beings. Its existence remains unknown unless diverticulitis or other complication ensues with production of symptoms to indicate the presence of some intra-abdominal lesion surgical in type.

The clinical diagnosis of diverticulitis is practically impossible, as there are no characteristic manifestations. In a few instances diverticula have been discovered roentgenologically after barium ingestion. Based on the history and the clinical findings diverticulitis is usually diagnosed as appendicitis. This happened in the case to be reported.

Various complications have been described as due to the presence of, or produced by, Meckel's diverticulum, such, for example, as volvulus, intussusception, invagination, intestinal obstruction, diverticular perforation from foreign bodies, acute diverticulitis; various associated lesions have been mentioned, such as cystic tumors, benign and malignant neoplasms, etc.

It is apparent, therefore, that Meckel's diverticulum is a menace to its possessor, and when discovered during operative procedure for other pathology should always be removed, unless to do so would unduly increase the clinical dangers. The supervention of acute diverticulitis is to be expected in a limited number of cases; moreover, it is estimated about 6 per cent of intestinal obstructions are directly or indirectly due to the presence of diverticula.

There are in vogue two methods of treatment in uncomplicated cases: (1) excision of

the diverticulum with closure of the ileal opening by sutures, (2) inversion of the diverticulum into the lumen of the ileum. The former is to be preferred if the diverticulum is large, the latter may be safely employed in small diverticula.

In the presence of complications, such as intestinal obstruction from volvulus, intussusception, strangulation, etc., where the ileum has become extensively involved and where gangrene is present or imminent, resection of the damaged ileal segment with end-to-end or other type of anastomosis, is regarded as the operative method of choice.

CASE REPORT

Patient, M. S., male, aged 23. butler, eighteen months previously was seized with a sudden attack of abdominal pain, preceded by nausea and vomiting, and was confined to bed one week. He was seen by another physician who made the diagnosis of acute appendicitis and advised operation which was refused. Since then he has had two other attacks of similar nature but of much less severity. Otherwise he had been fairly healthy, with the exception of considerable meteorism, and he said that he had to be more or less careful about his diet. He had typhoid fever six years prior to the present illness with good recovery.

About one week previous to the time I first saw him, he complained of epigastric pain and there was an associated nausea but no vomiting. Pain and tenderness finally became more pronounced over McBurney's point. The pain was quite severe and he remained in bed forty-eight hours. He continued to have tenderness and discomfort in the right side with more or less persistent nausea and cruetations until the time I saw him.

Physical examination: Patient a fairly healthy looking adult. Heart and lungs normal, teeth in good condition, tonsils small and not inflamed. In examining the abdomen no masses could be detected. There was rather marked rigidity over the right rectus muscle with acute tenderness at McBurney's point. The blood count showed 11,000 leucocytes with 80 per cent polymorphonuclear cells. Urinary examination negative.

The patient was given a purgative and asked return the following day for further investigation. Twenty-four hours later he reported that he felt somewhat better after free evacuation of the intestinal tract. However, the abdominal rigidity had increased and the tenderness was decidedly more acute. The diagnosis of a subsiding appendicitis was made and appendectomy advised. The patient was sent to the Jewish Hospital four days later.

Operation: On August 13th, 1928, under gas and ether anesthesia the abdomen was

*Read before the Louisville Medico-Chirurgical Society, February 8, 1929.

opened by right rectus incision. The cecum was found to be high (incomplete descent) and it was necessary to lengthen the incision before full exposure of the cecum could be obtained. The appendix was retrocecal, without mesentery and adherent to the cecal wall. It was necessary, because of the high location of the cecum, to amputate the appendix at its base and it was then freed from the cecal wall. The base was inverted with a purse-string suture of linen. The appendix was sclerosed and showed no evidence of recent inflammatory changes.

On further investigation of the abdominal viscera, a mass was discovered just to right of the umbilicus. This was surrounded by adherent omentum and it was possible to bring the entire tumor-mass outside the abdominal cavity. It was surrounded by gauze packs and the omentum freed revealing a Meckel's diverticulum situated about eighteen inches from the ileocecal valve. It was four and a half inches in length with lumen practically the same as that of the ileum. The serosa was injected and the infiltrated walls were much thicker than the ileum. There was evidence that the diverticulum had recently been acutely inflamed. Due to its location, we were certain this was the cause of the symptoms the patient had exhibited.

The diverticulum was clamped at its base, excised with cautery, and the opening closed in transverse direction to the ileal lumen with two layers of Lembert sutures of chromicized catgut. The ileum was carefully examined and showed sufficient lumen at this point. The suture line was reinforced by a segment of free omentum, and the abdomen closed without drainage.

The postoperative progress was quite stormy, the temperature rising to 102° F. within the first twenty-four hours. He continued to have a temperature varying from 100° to 103° F. for the next six days. On the fifth day postoperative there were numerous watery stools, the odor and appearance being very suggestive of typhoid fever. During this time the patient was given excessive amounts of fluid by mouth and subcutaneously. There was not the slightest nausea, very moderate abdominal distension, and practically no pain. He was seen in consultation on the fifth day by Dr. Morris Flexner. Due to the type of temperature and frequent liquid stools, the possibility of parasitic intestinal infection was considered. At this time jaundice was pronounced and considerable bile was found in the urine. Examination of the feces showed hook worm infection of moderate degree. The wound was frequently inspected but no evidence of infection could be found. On the seventh day postoperative some bulging was noted at the lower angle of

the wound. This was incised and a considerable quantity of foul smelling pus escaped. The colon bacillus was the predominating organism found in the pus. Following this the temperature immediately receded and improvement in the patient's general condition was noted. The wound drained about seven days longer when the discharge ceased.

At the end of the sixteenth day postoperative the patient was up and about with evidence of good, firm, healing of the incision. He was dismissed from the hospital on the twenty-fourth day postoperative apparently in good condition. He continued to improve and rapidly regained his health. Recent examination shows that he is entirely well with no further digestive disturbance.

The following pathological report was made by Dr. R. P. Ball: Gross description: Specimen consists of Meckel's diverticulum, measuring 4x2 cm. The orifice is 18 mm. in diameter and lumen is of uniform width. The mucosa is pale brownish gray, velvety, and shows rugae. Small areas of hemorrhage, averaging 2 mm., are scattered throughout mucosa. Appendix, 90x5 mm., is covered by fibrous tags, pale gray and flabby. Microscopical description: Sections through wall of diverticulum show marked lymphatic hyperplasia of mucosa and submucosa. There is a marked mononuclear leucocytic infiltration of mucosa consisting mainly of endothelial leucocytes and lymphocytes. The leucocytic reaction does not extend into the muscularis. Appendix: Muscularis is somewhat fibrosed and free from leucocytic reaction. Gross and microscopical diagnosis: chronic diverticulitis; sclerosed appendix.

In closing I wish to emphasize the importance of the suggestions made by a prominent surgeon several years ago:

(1) That, in intestinal obstruction of obscure origin, Meckel's diverticulum should be borne in mind as a probable causative factor.

(2) That, Meckel's diverticulum being a source of potential danger, should be removed when discovered during celiotomy for some other lesion, provided the condition of the patient will permit.

Finally, I would suggest the advisability of carefully examining the terminal two feet of ileum, to determine the presence or absence of diverticulum during every abdominal operation; and if one be found that it be removed unless to do so would unduly enhance the clinical risk.

DISCUSSION

J. Garland Sherrill: In the majority of instances Meckel's diverticulum has been discovered at operation or necropsy. As a rule we cannot differentiate this type of diverticulum roentgenologically from the shadow of the in-

testine itself. In a few cases where barium is retained in the diverticulum its recognition has been possible.

The frequency of this anomaly is considered to be about two per cent, but in this most surgeons will not agree. The structure of the diverticulum is similar to that of the intestinal wall and it is subject to the same changes.

All the Meckel's diverticulum I have seen involved the mesenteric side of the intestine, not the free border. The tissues become inflamed and the condition described by Dr. Grigsby occurs because of interference with the blood supply from absence of a direct mesenteric attachment. It is remarkable that the diverticulum does not become inflamed oftener because of the absence of a mesentery.

This anomalous development occurs within the terminal foot and a half or two feet of the ileum, and as the essayist has said, it is a part of the remains of the vitelline duct which is present only in fetal life.

I recall one case, seen a number of years ago, in which the patient had intestinal obstruction from Meckel's diverticulum and as a result a coil of ileum becoming looped around it caused obstruction necessitating resection of the intestine.

These cases are important. It should always be borne in mind that intestinal obstruction may be due to Meckel's diverticulum, and when ever the abdomen is opened, in a case of obstruction from any cause, hernia, appendicitis, Meckel's diverticulum and many other conditions that may cause intestinal obstruction must be considered.

It is of the greatest advantage to the patient who has obscure abdominal symptoms to have a really first-class surgeon who is capable of handling such conditions, instead of calling an immature surgeon who is able to perform only the simplest operations, since it requires a skilled surgeon to handle these cases properly.

Louis Frank: I have been very much interested in Dr. Grigsby's report. The postal card announcing the meeting and giving the title of the paper came yesterday, and when I reached the office found there a patient upon whom we operated six or eight years ago for an umbilical sinus. The patient had been treated for a long period for a discharging sinus at the umbilicus which we recognized at once as the remains of the vitelline duct. Operation disclosed a band-like structure extending from the umbilicus downward to the terminal ileum to which it was attached on the mesenteric side. It was an obliterated omphalomesenteric duct. In my school work I have always insisted that students know something about the embryology of the gastrointestinal tract, because it is so important from the standpoint of recognizing anomalies that may be encountered in the course of an abdominal operation. I delivered a lecture to the students a day or two ago on the subject of Meckel's diverticulum.

The term diverticulosis, diverticulitis and diverticulectomy cannot be applied solely to Meckel's diverticulum, because we recognize the term diverticulitis is properly used in a broader sense, and unless the location is specified, we understand the term to apply to those diverticula which occur in the lower segment of the large intestine not far from the transverse colon and low in the descending colon. The type the paper discusses is always designated as Meckel's diverticulum. These anomalies are not very common, yet they do occur, and that is the main reason why we insist that students study the embryology, anatomy and physiology of the gastrointestinal tract. This emphasizes the point made by Dr. Grigsby in his paper, that we should always be able to recognize anomalous developments when the abdomen is open.

It is very important, as Dr. Sherrill has said, that we draw a sharp distinction between the occasional operator and the experienced surgeon. We know that many appendices have been needlessly sacrificed by embryo surgeons or so-called operators. I have seen and examined many such specimens and there was nothing abnormal or pathological about them. Some of the patients have recovered and others have died. May it not be that many of these individuals, operated upon for so-called acute appendicitis, really had inflammation of a diverticulum which the operator did not recognize? Again this emphasizes the necessity of knowing something about the embryology and what is going on inside the abdomen. There may be occasions, however, when we are unable to recognize the remains of the omphalomesenteric duct.

The first Meckel's diverticulum I ever saw was discovered while performing an autopsy with a number of students who had been doing autopsy work at various times. Not a student present knew what the anomaly was. It was opened and examined and easily recognized as the remains of the omphalomesenteric duct. Most often the proximal end of the diverticulum is found open. I have seen several cases of the kind. One I remember distinctly was twisted and acutely inflamed at the time it was removed. In a number of instances diverticula have been discovered incidentally during operations for other lesions.

I think the symptoms produced by an inflamed Meckel's diverticulum are not identical with those noted in ordinary cases of appendicitis. The location of greatest pain is around the center of the abdomen rather than in the right iliac fossa. This distinction has been made by quite a number of surgeons and is important in arriving at a correct diagnosis.

Another point I wish to mention is Dr. Grigsby's statement that, should resection of the intestine become necessary, the method of choice should always be an end-to-end anastomosis. In intussusception, for example, it might become necessary to unite the small intestine and colon which would require splitting the small intestine

to make its lumen larger before one could do an end-to-end anastomosis. The difference in lumen of the two ends would here make side-to-side union not only easier but far safer. I can also conceive of situations in which there can be no question that lateral anastomosis would be the preferable procedure. The importance of preserving the circulation of the intestine, particularly at the points opposite the mesentery, must not be overlooked when performing anastomosis. While there are, of course, occasions when end-to-side anastomosis will be found advantageous, I do not understand the essayist's statement that end-to-end anastomosis should always be performed in the type of cases under discussion. The man accustomed to doing surgery and on the lookout for emergencies understands the importance of not interfering with the blood supply of the intestine and will adopt the method of treatment which offers the greatest safety to the patient.

L. Wallace Frank: I was very much interested in the essayist's paper especially the statistical part of it. During my internship with Dr. John G. Clark we made it routine practice in other than acute intra-abdominal lesions to examine the terminal three feet of the ileum. In more than two hundred cases we found only one Meckel's diverticulum. I have seen three or four cases of intestinal obstruction due to persistence of the omphalomesenteric duct. In one case the diverticulum was fibrous, hard, and led to the umbilicus. In two cases the diverticulum was attached at its distal extremity to the root of the mesentery and a loop of ileum had slipped between causing obstruction.

I may be mistaken but it is my idea that Meckel's diverticula may occur in places other than the terminal three feet of the ileum. I recall a case reported by Dr. A. R. Bizot before the society of Physicians and Surgeons three years ago in which there was a diverticulum of the jejunum fifteen or twenty inches below the ligament of Trietz, with all the characteristics one sees in the diverticulum of Meckel. Whether this should be classed as Meckel's diverticulum is merely an academic question, because from a congenital standpoint we know that a diverticular pouch containing all the elements of the intestine develops only when the individual has a persistent omphalomesenteric duct. This is only of academic interest, yet we do find these diverticula in places other than the ileum. According to the description given by Meckel, however, his diverticulum occurs only in the terminal ileum.

These cases are interesting and present problems in diagnosis and especially in treatment. I wish to emphasize the point made by Dr. Louis Frank that in cases where the diagnosis of appendicitis is made that operation through a one-inch incision is a thing of the past. When the abdomen is open one should learn as much as he

can of what is going on there without jeopardizing the patient either by too great manipulation or exploration in the presence of acute conditions. By removing a doubtfully diseased appendix through a one-inch incision which permits of no exploration one may overlook gall bladder disease, whereas if the incision is made two inches longer and exploration made with the hand the disease will be discovered. Many of these patients return with recurrence of symptoms after operation because of incomplete surgery or incomplete examination the first time. In cases of diverticula if one investigates sufficiently he will discover them, whereas without careful investigation they will be overlooked.

I had a very unusual experience three years ago in operating for what was supposed to be acute appendicitis in a child of ten years. It so happened that the child did have a mild acute appendicitis, and when the hand was introduced into the abdomen a hard, rigid area was felt which I took to be the appendix in situ. The appendix was mildly inflamed and was removed. The hand was then reintroduced into the abdomen to examine the terminal ileum. When the ileum was brought through the incision "it stood up like a ring," and was filled with ascaris. This merely shows what may sometimes be discovered in the abdomen by exploration.

I have enjoyed the paper very much and am glad Dr. Grigsby brought the subject of Meckel's diverticulum before the society.

Guy P. Grigsby, (in closing): One reason for narrating the history of this case before you was to call attention to the fact that perhaps some of us have not made as careful investigation of the viscera when the abdomen was open. I plead guilty to the charge personally, as probably I have not been as careful in examining the terminal ileum for Meckel's diverticula as I should. This case has seemed to be a source of warning, and I am sure in the future I shall be more careful in my examinations, particularly in cases where symptoms are ascribed to appendicitis and open the abdomen on that basis. There can be no question that other surgeons should thoroughly examine the abdominal viscera in such cases before closing the incision, which can be accomplished without subjecting the patient to any unusual dangers. I think there can be no argument about this.

The title of my paper was "Meckel's diverticulum: Diverticulectomy." Perhaps I should have added the word diverticulitis, as that was the condition found at operation. I made no reference to diverticula other than the Meckel's type. If I am not mistaken the term "Meckel's diverticulum" applies only to diverticula involving the terminal ileum, as that was the type studied and anatomically described by Meckel. It is quite true that diverticula occur in the large intestine especially the terminal portion of the

sigmoid, and also in the first portion of the jejunum, but so far as I am aware these lesions cannot be properly designated as Mecker's diverticula. Many cases have been reported in which intestinal obstruction and intussusception have been found associated with diverticula, in some the diverticulum being responsible for the obstruction, in others it was merely a complicating factor. As the case herein reported was purely one of subsiding acute diverticulitis, I considered it worthy of being recorded.

In regard to the diagnosis: I think it would be rather difficult, as in the instance herein cited, to differentiate between diverticulitis and appendicitis. The greatest pain, tenderness and rigidity were noted practically over McBurney's point, and there was a history of previous similar attacks. Operation showed that the appendix probably played no part in producing the symptoms, and the fact caused me to search further and in that way discovered the diverticulum.

As to end-to-end anastomosis where resection of the intestine becomes necessary: In the paper I stated that in complicated cases, where the intestine was extensively involved, end-to-end anastomosis after resection was the method of choice. I am perfectly well aware that in certain cases some other method would be more appropriate, and agree with Dr. Louis Frank that lateral or end-to-side anastomosis might occasionally be the better plan of procedure.

SUBTOTAL THYROIDECTOMY FOR EXOPHTHALMIC GOITER*

By FRED W. RANKIN, M. D., Division of Surgery, The Mayo Clinic, Rochester, Minn.

The earliest descriptions of exophthalmic goiter as a definite clinical entity are accredited to Parry in 1825, Graves in 1836, and Basedow in 1840. The names of the latter two men are constantly associated with the disease, as well as the names of many other clinicians and surgeons, both of the old world and new, whose constant and intense efforts have added much to knowledge concerning its pathology, symptoms and surgical treatment. The development of the surgical treatment of exophthalmic goiter in this country has been forwarded probably more by Halsted, C. H. Mayo and Crile than by any others, and the research work of Kendall, Marine and others, together with the clinical application of standardized preoperative preparation with iodine and clinical recognition of classical phenomena distinguishing it from hyperfunctioning adenomatous goiter, by Plummer, has done more to reduce the mortality and bring the treatment of exophthalmic goiter to a satisfactory level than any other factors. Despite the intensive research of many able observers,

the etiology of exophthalmic goiter remains indefinite. Whether or not it is of thyrogenic origin seems questionable, but its characteristic clinicopathologic picture and the disappearance of toxic phenomena following resection, as well as other indisputable evidence, indicate that the thyroid gland in the hyperthyroid state delivers to the body an excess of secretion altered or perverted in character.

Plummer, in 1913, made an outstanding contribution in the publication of important data differentiating adenomatous goiter with hyperthyroidism and exophthalmic goiter, establishing at the same time the foundation for the administration of compound solution of iodine (Lugol's solution) in the latter condition. He based his theory for the use of iodine in exophthalmic goiter on the assumption of two thyroid secretions, a normal one and an abnormal one, the former causing symptoms of hyperthyroidism and the latter the characteristic toxic symptoms. The degree of stimulation, the training and fatigue of the thyroid gland, the amount of secretion present at different times, and unknown factors probably were influenced, he believed, by the amount of iodine present.

The pathology of exophthalmic goiter is strikingly uniform in its characteristic evidence of diffuse parenchymatous hypertrophy, hyperplasia and increased vascularity, and later of an increase in the stroma of the gland. Also the number of cells lining the acini differs markedly in different glands and often in the same gland, showing a change in type from cuboidal to columnar, while the colloid material normally present in the acini is less than in the normal gland and often may be entirely absent.

Contributions of outstanding character to the chemistry of the thyroid gland have been made by Kendall, Baumann, Oswald, and Roos, Marine and others, resulting in the discovery of its active element and a better understanding of its physiology. In 1896 Baumann discovered iodine to be a normal constituent of the thyroid gland and later, with his co-workers, Oswald and Roos, demonstrated: (1) that ingested iodine is stored in the thyroid gland of animals; (2) that if it is removed from the diet of animals compensatory hypertrophy of the thyroid gland occurs, (3) that the iodine content of the thyroid gland is directly proportional to the amount of colloid, and (4) that in colloid goiter the percentage of iodine is relatively less than that of a normal thyroid gland. Baumann and Oswald isolated a globulin which they named thyreoglobulin. Kendall, in 1914, discovered thyroxine as a pure chemical compound, determined its empirical formula in 1917, and proved its structural formula in 1919. Its chemical and physiologic prop-

*Read before the Surgical Section of the Kentucky State Medical Association, Richmond, Sept. 11, 1928.

erties indicate that it is employed in the process of oxidation as a catalytic agent, and lead to the hypothesis that thyroxine is active in all or nearly all of the cells in the body. The amount of thyroxine present in the tissues of the average adult man is 14 mg. The thyroid gland delivers approximately 0.33 mg. daily, although the amount varies with the metabolic activity so that the function of the gland is to maintain 14 mg. of thyroxine in the body or to deliver to it daily 0.33 mg. Probably there are many other unknown but related functions. Marine and Williams, in 1908, stated that iodine caused a reversion in hyperplastic glands to the colloid type after two or three weeks, which bore out the research observation of Halsted that removal of the thyroid gland in pregnant dogs produced goiters in the pups at birth. Giordano and Caylor likewise found, in thyroid glands removed following ligation of the superior thyroid artery, changes similar to those described by Marine and Williams in hyperplastic glands of animals, following the administration of iodine.

The action of compound solution of iodine on the gland is quite characteristic, both from the standpoint of gross and of microscopic pathology. Prior to the institution of this agent, active exophthalmic goiters were vascular, bloody and friable and, from the technical standpoint, difficult of removal in many instances. Adequate iodination reduces this state to one markedly resembling diffuse colloid goiter, in that the change in the elements is constant and characteristic. Rein-hoff, Sager, and others studied the microscopic changes in the gland following resection after the administration of iodine and found them consistently to be as follows: (1) increase in amount of colloid; (2) increase in connective tissue in the gland; (3) decrease in vascularity; (4) increase in size and regularity of the acini; (5) decrease in the height of the epithelium; (6) decrease in the cytoplasmic bodies in the epithelial cells, and (7) decrease in mitosis and lymphocytic infiltration. With these changes, the friable, active gland becomes more easily handled at operation and grossly appears as lobulated and reddish with the characteristic meaty surface; it has lost its fragility and much of its vascularity.

Individualization of patients preoperatively and co-operative management by clinician and surgeon alike have enormously favored satisfactory end-results following surgical treatment of exophthalmic goiter. The three primary essentials of the preoperative period of management are iodine, rest and a high-calorie diet.

Routine preoperative treatment with compound solution of iodine in The Mayo Clinic

was begun by Plummer in 1922. The very definite results which followed the institution of this treatment have indicated its extreme value in the preparation of patients for thyroidectomy and have shown: (1) huge reduction in operative mortality; (2) practical abandonment of preliminary ligations and other graded maneuvers, and (3) absolute control of postoperative hyperthyroidism. Its administration by mouth has been carried out by giving 10-minim doses three times a day in the average case of moderate severity under hospitalization, which is adequate to control the symptoms and usually permits of resection at the end of a week or ten days. Clinical evidence of improvement, such as falling basal metabolic rate, decreased nervousness, and increased weight and strength is the indication of the opportunity for undertaking thyroidectomy. Occasionally, in milder types of hyperthyroidism, it is not necessary to hospitalize the patient, although occasionally in the severer types rest in bed must be insisted on for a period of weeks or often months. Compound solution of iodine is given up to the time of operation, and following operation all patients receive 50 minims by proctoclysis the first night and subsequently 10 minims by mouth daily over a period of twelve weeks, or until control of the hyperthyroidism is established. For the patient in crisis on admission, a dosage of 50 to 100 minims is administered immediately or over a relatively short time until the active symptoms show abatement. Formerly without the use of iodine, this type of case represented a medical mortality which seemed unavoidable in from twenty to twenty-five cases a year at The Mayo Clinic. The patients arrived sometimes practically moribund, always in a high state of toxicity, and death ensued in the first twelve to twenty-four hours. With the use of iodine these deaths have been reduced to two or three in each 100 cases. Not only are the desperate cases converted into good surgical risks and hospitalization reduced to a minimum, but it is worth nothing that of the eleven deaths from exophthalmic goiter in 1927 there was not a single death from acute postoperative hyperthyroid crisis which was formerly such a common accompaniment of thyroidectomy. High temperature and rapid pulse are common shortly after the operation, but they are of short duration, and unaccompanied by any of the characteristic phenomena of postoperative hyperthyroidism.

Hospitalization in a group, whereby patients are permitted to visit with each other and understand the routine procedures associated with surgical and medical management of the disease, encourages them to cultivate a better state of mind toward the treatment, and eli-

minates much unnecessary obscurity and mysticism in bringing these patients up to and through a surgical operation.

Formerly a high percentage of patients with exophthalmic goiter, probably more than a third, were operated on by graded procedures, such as lobectomy or single or double ligation. The disregard of these many-stage procedures, almost to their complete abandonment, has developed since the routine use of iodine, as the 1927 report of operations for exophthalmic goiter at The Mayo Clinic shows. There were 1520 cases of exophthalmic goiter operated on in The Mayo Clinic in 1927. Primary thyroidectomy was performed in 1517 of these cases. Two-stage thyroidectomy was performed in eight cases, hot water injection in thirteen, and ligation in only nine. The only indications which I recognize for multiple-stage operations are: (1) an extremely bad risk which obviously is the result of long-standing hyperthyroidism or general constitutional ailments; (2) local cause, such as a large goiter deforming the trachea and causing obstruction, or (3) cases in which operation has to be abandoned after resection of one lobe because of some technical complication, such as injury to the nerves or hemorrhage which is accompanied by sudden change in the patient's condition, with lowering of the surgical threshold of safety.

The choice of operation in the surgical treatment of exophthalmic goiter at The Mayo Clinic has come to be a subtotal type of thyroidectomy, resection of portions of both lobes and removal of the isthmus, leaving a portion of the posterior surface of the gland on either side to protect the blood supply to the parathyroid bodies and lessen the danger of injury to the recurrent laryngeal nerve. This type of operation, modified only in the steps of its application, resembles the procedures popularized years ago by Mikulicz and Kocher, whose names are so justly associated with the development of surgery of the thyroid gland.

The essentials in thyroidectomy which I have found most advantageous in removing the causal factors of mortality and establishing satisfactory end-results in the greatest percentage of cases are: (1) removal of an adequate amount of glandular tissue; (2) avoidance of injury to the inferior laryngeal nerve; (3) accurate hemostasis; (4) avoidance of injury to the parathyroid bodies, and (5) consideration of a satisfactory cosmetic result. Details of the steps of operation are familiar to all operating surgeons, but I wish to emphasize the importance of highly essential precautions, namely, avoidance of injury to the recurrent laryngeal nerve and the necessity and desirability of accurate hemostasis.

Practice in the clinic is to remove one lobe and complete the operation on that side, and after allowing the patient to wake up (if under gas anesthesia) so that the spoken voice may be heard to proceed with a similar type of resection on the opposite side. I believe that mobilization of the gland in order to expose its posterior surface and avoid leaving projections subtracheally is highly essential. Uncovering the gland through a low transverse incision with elevation of the skin flap permitting the platysmal muscle to remain with the fascia and prethyroid muscles, the latter muscles are separated through a longitudinal incision and retracted widely. I have not found it necessary to divide the superficial musculature of the neck except in cases of large goiters or in event of some complication, such as severe bleeding. The sternothyroid muscle is now divided and disregarded much as the cremaster muscle is in herniorrhaphy. With the gland elevated on the finger after ligating the middle thyroid veins, one may not only control some hemorrhage by pressure but continue the dissection at a level above the trachea, keeping in a safe zone so far as injury to the nerves is concerned. Ligation of the blood supply and removal of glandular tissue quickly and accurately follow, a wedge shaped piece being removed so that coaptation of the cut edges by suture prevents oozing while, at the same time, the danger of injury to the nerves is minimal.

Hemorrhage which occurs following thyroidectomy usually is venous or from a small arterial twig, springing from a branch of the inferior thyroid artery. Large branches, such as the superior and inferior thyroid arteries, bleed so freely that they cannot be disregarded for a moment; such hemorrhages usually occur during or immediately following operation, but the most serious hemorrhage and the one most difficult to control is the oozing which fills the neck with clots and which produces dyspnea and choking twelve hours or more later. In the event of this type of hemorrhage the neck must be opened, the clots removed, and the point of bleeding sought and ligated. Attention to the details of scrupulous hemostasis avoids this complication in practically all cases, but occasionally it will occur and is most undesirable and serious unless attended to immediately.

Unquestionably, progress in anesthesia has aided materially in surgery of the thyroid gland. Balanced anesthesia from a local anesthetic and either ethylene or nitrous oxide and oxygen is, I believe, the anesthetic of choice. My own personal preference is ethylene and a local anesthetic although other combinations are entirely satisfactory. I prefer to anesthetize the patient with ethylene

and inject the neck with 0.5 per cent procaine. By the time the skin flap has been raised and one lobe mobilized, the patient is allowed to wake up and the lobe may be ligated without further anesthesia. This avoids the disagreeableness of "needling" the neck for the induction of anesthesia and the patient prefers to miss this procedure. Usually, with injection of the second lobe the operation may be completed without further administration of ethylene, although the ideal anesthesia is analgesia throughout the operative procedure.

Drainage following thyroidectomy is instituted in practically all cases. I believe it is possible in certain cases, perhaps in a large percentage of them, with scrupulous technique and painstaking hemostasis, to be able to close the wound without drainage but I have yet to be impressed with the necessity of this; I institute drainage for twenty-four hours as a routine. The drainage, rubber tissue, is placed laterally, in a stab wound through the right ribbon muscles so that approximation of the ribbon muscles in front over the trachea may be accurate. This avoids the undesirable and unsightly complication of puckered adherent scars which rise and fall with swallowing. In primary thyroidectomy I do not leave the neck open and pack the wound with gauze, since evidence is not at hand to substantiate the assertion that a noxious product from the thyroid gland is absorbed by closure of the wound.

The downward progress of the mortality rate in all clinics in recent years has been a most remarkable monument to improvement in surgical technique, co-operative management, earlier diagnosis and the routine administration of iodine in cases of hyperthyroidism. When surgical treatment for this ailment was instituted, a mortality rate of 25 to even 30 per cent was not uncommon but its recent reduction to 4 per cent, then to 2 per cent, and now to 0.75 per cent indicates the progress that has been made.

MORTALITY RATE IN 1927

	Cases	Mortality	
		Cases	Per cent
Exophthalmic goiter.....	1520	11	0.72
Adenomatous goiter with.....			
hyperthyroidism.....	615	5	0.81
Adenomatous goiter without.....			
hyperthyroidism.....	502	1	0.19
Carcinoma.....	37		
Total.....	2674	17	0.63

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DISCUSSION

J. G. Sherrill, Louisville: I don't know any particular reason why I should be asked to discuss this paper. My experience with goiter has not been as large as that of some. The number of cases presented by Dr. Rankin is so large that it is really not worth while for me to discuss the proposition.

It has seemed to me that we were quite a long time in clarifying this subject, and for many years I wondered why I operated on fewer goiters than a great many other men. During those years, I was treating the goiters that came to me, with iodine, and many times they improved, so that I operated on about one case in ten of goiters that I saw.

It does not make much difference whether you operate under gas and local anesthesia, gas and ether, or local anesthesia alone. It is not necessary to go into the extensive work that Crile does to hide the operation from the patient.

I have used local anesthesia very satisfactorily, and I have never seen a patient complain of much pain. The pain is in the skin.

In my experience we have made the conclusion that the danger in goiter lies largely in the length of time that the goiter has existed as a toxic disease. When the heart begins to be affected and degeneration of the myocardium is present, the patient is an extremely grave risk. Frank Lahey, in recent years, has given us much to think about in these cases of bad hearts in goiter.

The toxemia which results after an operation from goiter of the toxic type, occurs very largely from the extensive manipulation which is done, and the amount of toxic material that is squeezed out of the glands into the tissues. Therefore, whatever plan of operation you follow, I believe you will get less toxicity with delicate manipulations and simple dissection without traumatizing the gland very much.

I saw the elder Kocher a number of years ago do some of his beautiful work on goiter, and it is pretty work when it is nicely done. A bungling goiter operation, gentlemen, is one of the worst things you can see. My belief is that this is not a field for the occasional operator; this is the field for the man who has a large experience and sound judgment.

My experience has been that it is almost as dangerous to ligate a pole as it is to take out a goiter in a clean way. The best thing to do with a toxic goiter is to put these patients to bed, give them ice on the neck, keep them quiet, and use some iodine in preparation for operation. If the heart condition is bad you had better wait and take counsel, because that is a serious risk. Whenever you have a myocardial

degeneration already present, the case is serious and the cardiac condition already present, is the guiding thing as to your operation.

With regard to taking out the isthmus or leaving the isthmus and taking out the lobes, there is a question as to whether taking out the isthmus does not leave a greater deformity over the movement of the trachea than if you leave the isthmus in and take out the lobes up near the isthmus. Another thing a man of experience gets is the knowledge of how much to take out and not overdo it; neither do you want to underdo it. You have to estimate very accurately the amount of gland which has to be taken away in any given case.

Dr. Rankin has given us a clear-cut resume of this subject and I think it will be of benefit to all.

Irvin Abell, Louisville: I greatly enjoyed Dr. Rankin's paper. He has given us a most excellent resume of the subject in what has, to practically all of us at the present time, become, so far as principles are concerned, a standardized procedure. I know of no class of surgery in which the improvement has been so marked as in that of toxic thyroids.

I am sure all of us recall the times to which Dr. Sherrill referred in speaking of the mortality from ligations when most of us were all but ready to abandon surgical efforts to cure exophthalmic goiter, because of the attendant mortality. I, too, have had his experience in having lost during those days as many or more patients from ligations than from thyroidectomy, but in the light of subsequent knowledge and experience, I realize it was due to my lack of judgment rather than to any fault with the procedure itself.

We still do an occasional polar ligation. There are patients who come under observation with exophthalmic goiter, who do not readily lend themselves to improvement during the preparatory period, to rest, food and iodine; there are some who apparently have an idiosyncrasy to iodine, and in such instances we still employ polar ligation, but with our improvement in judgment in using proper preparatory treatment, we have in the past four years seen no mortality from such ligation.

I don't know of any more dramatic result in all surgery than that of the exophthalmic goiter patient who is nervous, who is unstable, who is unable to eat, having periods of vomiting due to exacerbations, who is unable to sleep, who presents an exceedingly rapid pulse, and who under the preliminary treatment as outlined by Dr. Rankin, in the course of two or three weeks, is able to undergo a subtotal resection and have the nervous balance restored almost within one week's time. As I say, I know of no more dramatic result in all of surgery than this one thing, and we are extremely grateful to those whose researches have made this possible.

I have not had the large experience, that Dr.

Rankin has had. We, in our clinic, usually operate on between eighty and ninety goiters a year, about sixty or sixty-five of which come under the exophthalmic, or at least the hyperplastic toxic type, our experience in so far as mortality is concerned in the past four years has been a fraction over one per cent, whereas, formerly our experience with the same type of goiter previous to the introduction of the iodine ran something like sixteen per cent.

So I state that in so far as principles are concerned, the standardized procedure is that which has been adopted and presented so beautifully this evening by Dr. Rankin. In so far as the etiology is concerned, that, as stated, we do not know, and until we do know it must of necessity be a matter of judgment both as to the preparatory treatment and the amount of thyroid tissue removed, the results previously obtained guiding us in both instances.

In attending a meeting in Ohio recently, in the goiter belt, I was rather surprised to find rather wide diversity of opinion in regard to the amount of tissue to be removed. One surgeon, who has had an unusually large experience, stated that he was taking more and more of the thyroid tissue in these cases, and immediately following, a surgeon, who operates upon from 900 to 1000 goiters a year, made the statement that he felt that as a result of the colloid change following the preparatory treatment with iodine, he had gotten more evidences of hypothyroidism after operation, than formerly, he was now leaving more of the gland than formerly.

In our experience, we have had two patients with exophthalmic goiter, who subsequent to operation developed hypothyroidism. One of these was operated on before the days of iodine preparation, following a bipolar ligation and subsequent subtotal thyroidectomy, and one three years ago following preliminary iodine preparation. Both of these continue to exhibit hypothyroidism and are still taking thyroid extract.

About three per cent of our cases, in so far as we have been able to follow them, do show subsequent trouble either in the shape of hyperthyroidism or of adenomatous development in the remnant of gland which has been left behind. Possibly the total percentage is higher; at least three per cent have come back to us for advice relative to trouble subsequent to operation. If we know of those who have consulted other doctors referable to the same situation or condition, the percentage possibly would be definitely higher.

We have been accustomed to giving larger doses of iodine to our patients in the preparation for operation than is indicated by Dr. Rankin. We heartily agree and follow out just the things that he has suggested in so far as rest, iodination, and the high-caloric food intake are concerned. It has been our custom to

give lemonade, which contains sugar of milk, to force the starches and the sweets and in the week preceding the operation, to give from fifteen to thirty minims of the Lugol's solution three times daily, depending entirely upon the evidence of toxicity which the patients present, and also to continue a dosage of from twenty to sixty minims during the two days that follow operation.

Our experience has been comparable, at least has run parallel to that of Dr. Rankin, in the matter of mortality. As I said previously, this is a fraction over one per cent and has not been due to acute hyperthyroidism, but on the contrary has been due to myocardial disease.

Dr. Sherrill brought into the discussion, the particular dangers which attend operations upon the advanced cases. If one secures these patients early and they are subjected to surgery before distant degenerations have occurred, particularly in the myocardium and in the kidney, the mortality can be kept down. Our own mortality now comes in operating on the delayed cases, patients who come with edema of trunk and legs, not vascular edema, but of the lymphatic, hard, dense type; those with definite myocardial changes, possibly endocardial changes and those with high blood pressure, 190 to 200; it is in taking this type of case that we find our difficulty at the present time.

I should be glad to know from Dr. Rankin, in closing his discussion, his opinion of the propriety of digitalization of patients. This at the present time is, I am sure, a question upon which all will not agree. There are those who claim that even in the presence of myocardial degeneration, the administration of digitalis is not of advantage; while in our earlier experience we gave digitalis to practically most of our exophthalmic cases. It has been discontinued except where such patients present definite myocardial degeneration, with or without fibrillation, or decompensation. It is still our custom to give such patients digitalis in addition to Lugol's in preparation for thyroidectomy. I shall be very glad if Dr. Rankin, in closing the discussion, will be good enough to give us his ideas upon that particular phase of the subject.

Again I wish to express my appreciation of Dr. Rankin's visit to us, and to tell him that we are all glad to welcome him and to see him, and to thank him for the splendid presentation which he has given us this evening.

W. W. Anderson, Newport: It would be quite out of place for me to undertake to say anything as a word of caution to these eminent men who have presented and discussed this very able paper, but for the rest of us who are not widely experienced surgeons, I should like to say a word of caution in regard to our goiter cases.

Too often when we find a patient with symptoms of toxic goiter, the tachycardia, the excitability, the dermographia, some of them perhaps

with the eye symptoms also, we jump to the hasty conclusion that this is a patient with toxic goiter.

I just want to say that we ought to study these cases all over and not for goiter only, and we will be surprised how many of them will clear up the symptoms that have led us to the diagnosis of a toxic goiter if we remove the diseased tonsils, if we get rid of the focal infection in the mouth, or elsewhere in the body, and we will have nothing left to operate on in the region of the thyroid, because it will disappear.

Then at the other extreme I should like to speak a word of warning that has already been hinted at, that we must certainly not let those cases that do require operation on the thyroid wait too long before they get into the hands of the surgeon. He can't restore a heart that has gone irreparably bad, as some of them do. He can't restore a nervous system that has been so long and so badly impaired that there is not the material for the recovery of it. We must not let them go to that point.

In that connection, I want to protest the rather careless use, it seems to me, of the word "myocarditis." The heart symptoms in these goiter cases are not due to myocarditis. If that word means anything, it means inflammation of the heart muscle, and it is not inflammation of the heart muscle in goiter cases. It may be a toxic degeneration of the heart muscle, it may be a degeneration of the heart muscle from prolonged overwork, and it may be just a wearied heart muscle; it is a myocardial insufficiency, but it is not myocarditis.

Frank P. Strickler, Louisville: I have enjoyed Dr. Rankin's paper very much. He certainly has had an unlimited experience in goiter work. There is only one part of his paper on which I want to touch, and that is the subject of anesthesia. Personally I think a very large per cent of these cases can be done from the first incision to the last suture under properly given local anesthesia. There are all kinds of local anesthesia, but I mean a properly given local anesthesia.

These patients should be prepared in the right way the night before operation about bedtime, you give them ten grains of veronal, and the next morning about three hours before operation you give them ten grains more of veronal, and one hour before operation, give them either a sixth or a quarter of a grain of morphine with 1-250 of scopolamine. Your patients will come to the operating table in a drowsy state, but you can arouse them and talk to them. You can inject your anesthesia, one per cent novocain, without any difficulty at all. You go ahead and inject your skin, and about the only other place you have any discomfort at all is when you begin to elevate the gland. By that time the patient may be restless, complain of discomfort and be a little nervous. At that stage simply give

another sixth of a grain of morphine or a quarter of a grain of morphine, depending on how restless the patient is and how much he is complaining. Once the gland is elevated and removed you can go ahead and finish the operation absolutely without any discomfort at all.

I believe this can be done on a large percentage of patients if you don't get in too big a hurry, and don't get too rough with your patient. If you can do a goiter operation under local anesthesia and keep your patient comfortable and talking the whole time you are doing it, the element of danger of injury to the recurrent laryngeal nerve is absolutely removed and there is no possibility of injuring the nerve. The minute you touch that nerve when the patient is talking, his voice will become husky and if you put a haemostat on it, you can take it off before you do any damage at all. I think eventually practically all goiter cases will be done under local anesthesia without administration of ethylene, nitrous oxide, ether or any other anesthetic of that type.

I was rather surprised to hear Dr. Rankin make his reference to the section of the platysma. I think about fifteen years ago Dr. Wathen first made reference to the section of the platysma by use of the scissors and blunt dissection. Six months ago Dr. Lahey of Boston made the same reference. I think if any credit is due on that subject at all, we ought certainly to give it to our local man.

W. O. Johnson, Louisville: I wish to thank the essayist for the many instructive points he has brought out.

There are a few points that remain to be stressed. I have seen the most severe cases of ~~hypothyroidism~~ occur in patients, that have not had a visible or definitely palpable enlarged thyroid gland, and these cases are the most difficult to handle.

Next in importance to iodine in the preparation of goitre patients is plenty of sedatives and fluids. A fluid balance of 2000 to 2520 c.c. every 24 hours.

There has been a great deal said about the types of operations, I think there is one thing that we must consider, that the type of operation in one man's hands may be perfectly satisfactory and the same operation in another person's hands is no good at all. The type of operation, together with pre-operative and postoperative care that obtains the most satisfactory results for any one operator, is the operation of choice for the individual.

The most important thing that has been left out in the paper and discussion (and very little has been left out) is the admission of the fact that we are not able to properly prepare a certain number of these cases for operation. Patients that are sick usually need to be met half way or a little more than half way. Why can't these patients be prepared the best possible, and

then meet them more than half way by operating in the room in bed. This saves them all of the nervous excitation, and twice as much operative work can be done with less post-operative reaction than on the same patient if they were taken to the operating room.

J. R. Wathen, Louisville: We are all greatly indebted to Dr. Rankin, coming with such a ripe experience from the Mayo Clinic.

In my own work I have given up the use of digitalis in auricular fibrillation, having had sixteen cases recently, and some which did not do so well under its use. I agree heartily with Plummer that digitalis is harmful in auricular fibrillation.

I see no necessity for introducing toward the close of an operation, ethylene or nitrous oxide. We can get over this beautifully with local anesthesia properly administered. I do believe a great deal depends upon the preliminary preparation of our patients. I heartily agree with Dr. Strickler in the use of veronal. I give fifteen grains the night previous to operation, half that the next morning, a quarter of a grain of morphine, one hour before operation, then inject novocain at the tender spot on the border of the sternomastoid muscle, which can easily be felt about a centimeter above the external jugular vein. This spot catches the second, third and fourth cervical spinal nerves. When we start to elevate the gland we find pain. If you will inject three-quarters of one per cent novocain with a slight amount of adrenalin to the posterior border just below the vessels at the superior pole, you will anaesthetize the sympathetic nerves at this point, which nervous system controls the pain, and which is associated with the elevation of the gland.

In the last three years I have resorted to but one case in a fairly large number of goiters where I have been forced to use some general anesthetic and that was when I accidentally ran across a malignant goiter. I see no reason for introducing any general anesthetic for the reason that you are liable to injure the recurrent laryngeal, and you can talk to the patient entirely through the operation when only local is used. I see sitting next to Dr. Rankin a physician on whom I did a double resection without any general anesthetic and he looks pretty healthy today.

Fred W. Rankin, Rochester, Minn., (in closing): Dr. Strickler, I thank you for telling me about Dr. Wathen being the first man to find that the platysma should be left not elevated with the flap. I did not know that he did this. I think it is a very excellent step. I shall continue to use it and give Dr. Wathen full credit for it, and I assure you that I think it is just in line with the very excellent thyroid surgery that I have seen him do and know he is capable of doing.

In answer to Dr. Abell's question of digitalis, I am in no way qualified to discuss the action of

digitalis therapy in goiter cases, but Dr. Plummer has abandoned the use of it entirely in toxic goiter cases with the single exception of completely decompensated cases which refuse to do well or to react to prolonged rest. We never use it in fibrillating cases, and do not consider fibrillation unless there is some decompensation as any indication for its use. I am sure that its abandonment has been a decided factor in the reduction of our mortality along, of course, with certain other co-operative measures which have been instituted.

I think the causal factors of mortality may be summed up under about three headings: First, the time element at which the goiter comes for surgery; second, the concurrent debilitating diseases which one finds in a certain group of cases such as advanced nephritis, diabetes, or visceral degenerative changes which are the result of longstanding thyrotoxicosis; and third, the case in which technical errors occur such as injuries to one recurrent laryngeal nerve or massive hemorrhage or some other such disagreeable complication.

In looking over the cases of exophthalmic goiter which died at the clinic in the past year, the eleven cases in this series, not one case had been hyperthyroid for less than a year; in every case the hyperthyroidism had extended from one to two or three years without exception, and the group that appeared with symptoms less than a year had no mortality at all in this particular year.

I should like to emphasize the fact that iodination of a hyperthyroid case is not a curative measure but entirely a preparatory measure. Just how much iodine one gland will take and just what changes will take place in that gland is not an entirely standardized thing, and after resection one finds just such glands as Dr. Frank described, where the characteristic changes following iodination have not taken place, despite the fact that the clinical symptoms have improved enormously and that the risk has been hugely lowered by its administration.

I do not think that clinicians should hold on to hyperthyroid cases because they are improving under iodination, but when the maximum point of improvement has been reached, the resection of the gland should be undertaken in all cases. That resection, I am perfectly confident, can be accomplished at a primary operation as thyroidectomy in one stage in practically all cases—certainly more than 99 per cent.

State of Thyroid in Skin Diseases.—Out of sixty-five cases of vitiligo, alopecia, psoriasis, seborrheal acne and other skin diseases, Sparacio found hyperthyroidisms in twenty-one and hypothyroidism in twenty-two. Many patients improve under thyroid medication. In several cases with deficient ovarian function, the basal metabolism was normal.

THE TREATMENT OF POST OPERATIVE HERNIA*

By GANT GAITHER, B. A., M. D., F. A. C. S.
Hopkinsville.

The occurrence of an incisional hernia following laparotomy is fortunately relatively rare under present technique, but is always a cause for serious disgruntlement to the unlucky patient to whom it happens. It is therefore a challenge to surgical skill to repair, a criticism of surgical judgment to prevent.

The decrease in the number of postoperative herniae in recent years is due to the earlier recognition of the surgical abdomen by both the professional attendant and the laity, so that many drainage cases of older days are now operated before the presence of pus in the abdominal cavity necessitates drainage with its accompanying weakening of the line of incision. We still have however too many cases that are delayed before surgical relief. This is probably more true of gall stones than any other condition. Nearly every case of empyematous cholecystitis has seen the time within the year or so previous, when a diagnosis of mild cholecystitis or gall stones could have been made and an ideal operation without the necessity of drainage could have been done. The same thing is true, but to less degree, of acute appendicitis.

If the number of drainage cases can be lessened, the corollary follows that we shall have fewer incisional herniae.

The technique of closure of the abdominal wound is one to which each surgeon gives careful consideration. A criticism at this point may be directed to the use of the continuous suture in peritoneum and fascial sheath over too great a lineal distance. If through inadvertance in knotting, through breaking from vomiting or coughing, the suture cuts out, sufficient schisis in the wound will occur to be the beginning of an incisional hernia which may not show up for some months. To obviate this occurrence, it is well, at reasonable distances in these lines, to interrupt the continuity by tying.

In the approximation of the rectus sheath or the external oblique, the tissues should always be completely bared of the fat particles and muscle shreds which may at times interpose, interfering with part to part union and leaving small points of weakness through which invagination may occur at a later moment.

The selection of the location of skin incision and its length are further interesting points to consider in the prevention of hernia. Of recent years we have seen a wide swing away

*Read before the Surgical Section of the Kentucky State Medical Association, Richmond, September 11, 1923.

from the small button hole incision of twenty years ago, because of the overlooked pathology that was often present and went unrelieved. This era was followed by that of the long almost eventrating incision which is still largely in vogue. At the risk of being a bit old fashioned, it seems to me that there are still many selected cases where the short lateral incision is satisfactory and certainly gives the patient a better abdominal wall to live with than the more central and longer incision. I have special reference here to unquestioned acute appendicitis in children, in heavy working miners and farmers to whom muscle pull is of great importance. In these cases and many others where diagnosis has been well determined, I still try to conserve the integrity of the abdominal wall. I do not subscribe to the saying that a long incision will heal as well as a short one. If the hands of the operator are very large and his fingers need the room, the long incision may be necessary. It is better to study the case more thoroughly before operation, with a careful history, physical and x-ray examination than to feel we can make up for this deficiency by a belly splitting incision that will spill the diagnosis before one's eyes.

Another cause of postoperative hernia is found in the presence of infection in the wound. The continued pressure of pain after the third day or unreasonable elevation of temperature over 100.8 should be sufficient justification for removal of dressings and inspection. Prompt relief of pressure of pus on this day, rather than the fifth or sixth day will do much to prevent burrowing into healing tissues, this in turn limiting the chance of a weakening of the strength of the wall. This evacuation, in my judgment should be done with as little disturbance of the operative suture as possible.

The selection of the proper anesthetic is also a matter of much moment as to the prevention of incisional hernia. When one sees stitches pull out easily during the process of closing up the abdomen, and himself proceeds to make the closure very gingerly and delicately, fearful to make much tension lest the sutures cut out, how may he expect that line of sutures to hold fast during even brief spells of vomiting or coughing post-operative. Wherever possible the work should be done under nitrous oxide or ethylene, reserving ether for cases in which these gases are contraindicated. The inguinal and femoral herniae are often easily accomplished under novocaine locally. Through this safeguard in anesthesia, much post operative distress as to cough and vomiting, may be obviated.

Another point to which I would direct attention, is the handling of the operative case from the operating table to the wheel carriage

and the bed. The anesthetist should supervise this very carefully and insist that all lifting should be gently done, as well as handling and placing upon the bed, so that undue stress may not be put upon the suture and approximated tissues.

Another adjuvant in prevention of wound stress is the free use of morphine hypodermically during the three or four days immediately post operative. This treatment is rarely contraindicated, in fact is valuable from most every other consideration as well.

The length of stay in bed and the proper instructions upon leaving the hospital, both play a part in securing perfect wound healing. Our patients are handed printed instruction cards when they leave the hospital, varying with the condition for which operation was performed. These cards are identical with ones advocated about ten years ago by Dr. Stuart McGuire, of Richmond, in fact contain his indelible wording. We have found them most satisfactory and time saving.

So much for a brief sketch of factors entering into cause and prevention of post operative herniae.

The cure of the condition, once it has supervened is frequently quite difficult. Efforts to secure results begin with careful preparation of the skin in these patients. They are usually obese with many wrinkles or creases in the abdomen. Soft bristled brushes are used with soap and water for the first cleansing and may be repeated if an unusual case.

We use two types of operative technique, depending upon the size and age of the hernia, either the obliterative or the reconstructive type technique.

If the hernial opening is not too old and is not larger in circumference than a silver dollar, then we usually plan a reconstructive operation. This will consist of careful exposure of the hernial sac, with inspection and reduction of its contents, doing as little to these organs as possible. The muscular boundaries of the hernial ring are then dissected and fascial sheaths opened. The peritoneum is closed as in a primary laparotomy. Mattress sutures then imbricate inner fascia over outer fascia, reproducing as nearly as possible the original anatomic structure of the abdominal wall. Redundant skin is excised and usual stitches placed.

In the ancient and massive herniae, such technique is entirely impossible as these tissues are over stretched and may not be recognized or approximated without extreme difficulty. It is our custom here, to expose the hernial sac, return after inspection the viscera to the abdomen. The entire musculo aponeurotic wall with its inner coating of peritoneum is caught by doubled iodized cat-

gut sutures, mattress in style; the external wall being pulled under the internal wall in this overlapping for a varying distance of from one to one and a half inches. We place the first of such sutures at the approximate center of the former hernial opening and then halve each remaining half of the length of the opening, none of these first stitches being tied until the entire approximating row has been placed. These sutures when finally all placed are very close together so that they completely close the abdominal cavity when tied, as there is no separate suture placed in the peritoneum. These primary sutures are first caught in artery forceps immediately after being placed. When the operator is ready to begin tying, they are all pulled taut by the assistant so that the weight and stress of approximation of the two abdominal walls is borne by eight or ten untied sutures, while the operator takes the one to be tied. He can accomplish this without tension upon either the catgut or the human tissues as these are already in apposition. The excess of inner fascial and muscular wall, now left overlapping the outer wall, is tacked down with interrupted catgut, securely fastening the hernial repair in its new position.

As a final step it is our custom to place lateral drainage tubes parallel to the skin incision. This is done before closure by making four small skin incisions, two on each side of the skin wounds, one at the top and one at the bottom on each side. A split rubber tube of proper length is then introduced on the right side the top drainage incision and brought out the bottom drainage incision. Both tubes thus parallel the hernial repair. On the left side of the wound a similar tube is placed. This permits tension sutures over the centre of the wound to be approximated and all oozing and wound secretion to find prompt exit, and yet no tubing or foreign material is in contact with the buried sutures holding the hernial repair. This one step has been of the utmost value to us and I can most heartily recommend it to you for use. Skin closure is as usual.

From our records we can report eighteen cases of such repairs, one of the eighteen however, being a case of diastasis recti of severe degree following pregnancy and delivery and in which a ten inch overlapping reconstructive type of operation was done with most gratifying results. We have had one operative death. This was from septic peritonitis of severe and fulminant type. The cause of it was never found and autopsy was not done. It was probably due to a minute injury to an intestine during dissection of adhesions, overlooked at the time of occurrence. We had no cases of post operative pneumonia in this

series. One patient in the early portion of the series had recurrences, undergoing three operations but with final cure, reconstructive operation being tried twice unsuccessfully and the obliterative used in the last one with relief.

We have had nine of the smaller type cases with reconstruction, eight of which have been entirely relieved. One recurred within three months, would not be reoperated and died some years ago with splenic anemia. This hernia was at the very bottom of a midline incision just above the pubic symphysis and was quite easy to repair. However, post operative the patient was badly nauseated and undoubtedly the suture line gave way.

In the massive herniae series, there are nine cases with one having two recurrences and final cure, two with partial recurrence, one being reoperated with cure, this being a case following laparotomy for pus tubes with drainage and destruction of a large portion of the fascia of the abdominal wall. The other six cases of massive hernia have secured satisfactory results at one obliterative type of operation.

WHAT THE GENERAL PRACTITIONER SHOULD KNOW ABOUT RADIA- TION THERAPY*

By W. F. BOGGESE, M. D., Louisville.

We have learned a great deal about Radium and Radio active Substances within the last eight or ten years, and every practitioner should be deeply concerned and open-minded in its practical application as a therapeutic remedy. In the transition from fixed procedures and opinions forced by the introduction of a new and so powerful a remedy as Radium, there has appeared naturally a two-sided re-action largely through ignorance on the one hand, and its limitation and abuse in the hands of the over-zealous operators on the other. So great has been the improvement in the technique in the last few years that in the hands of competent Radiologists its safety is guaranteed, that Radium has not only become a powerful ally, but an active rival of the surgeon, and that Radium when skillfully and judiciously applied will often yield extraordinary cures where surgery often fails. (R. Matas).

Allow me to quote from an article written some years ago by Dr. Matas, of New Orleans:

"It is no longer a question whether Radium is to be applied, for instance, in operable cancer, and only after surgery has failed, but whether it should not be given the preference at the start as the initial and only treatment. It is quite natural that at the present time, many if not the majority of surgeons are

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reluctant to surrender to the new therapy some of choicest and most deeply conquered possessions. It is also evident in the present state of our knowledge, that radium cannot cope with the great mass of the visceral cancers and other internal neoplastic diseases, which are practically, if not absolutely, inaccessible to its action. On the other hand, it is quite clearly proven that whenever and wherever the morbid tissues can be brought fairly within the sphere of its influence, it can accomplish cures which are equal, if not superior, to those of surgery without any of its risks or fatalities. To arrive at conclusions in an absolutely fair and unprejudiced way is not always easy, as the interpretation of facts is so deeply influenced by the inclination and training of the observer."

It is not within the scope of this paper to cover those conditions of advanced and inoperable cancers in which radium and x-ray have been so extensively used for many years; nor is it within the scope to discuss the wonderful results of the use of radium in Carcinoma of the Cervix Uteri. Some very interesting statistics can be found in the Journal of the American Medical Society of August 4th. Nor is it my purpose to cover all the conditions in which radium has been applied either primarily as the sole curative agent, or secondarily as an adjunct to surgery.

First. The first character of cases to which we shall call your attention is the great and increasing number of Fibroid, Fibro-Myomatous, and Myomatous Uteri with excessive bleeding occurring in women generally between 35 and 45 years of age. My experience covers a series of forty-four cases, covering a period of eight or nine years. In every case we formerly would have had recourse alone to surgery with its greatly increased mortality and morbidity. In practically all of these cases varying from slight sub-mucous fibroids to very large mural tumors extending to and above the Umbilicus there has been entire relief from bleeding, control of all symptoms, and practically complete regression of the tumor. In none of these series have we had any serious reaction or complications. The effect of radium upon most of these rapidly growing intramural Myomas has been marvelous—the entire and complete relief of all symptoms, the rapid regression of the tumor mass, the complete return of the Uterus to practically its normal size—the freedom of pelvic disturbances, is one of the happiest experiences of my professional career. In all the cases of Fibrous types of Uteri we have had no serious complications. One or two cases after intense variation developed a Pyometria which was easily and quickly relieved. Many of the patients had considerable nausea and acidosis following the radiation

which of course was only temporary. In no cases have we observed any pelvic Cellulitis or Peritonitis. However, allow me to call your attention to the fact that cases with active pelvic inflammation, such as Pyosalpax are not favorable cases for irradiation, and radium should not be used—recourse must be had in these cases to surgery. In the pulling down of the Uterus and the Curettage, thus breaking adhesions, traumatizing tissues that are already infected before the radium is inserted may in itself whip up a latent condition into an acute active condition with great hazard to the patient.

In three cases of extensive Myomatous Uteri which after a period of one to three years came to subsequent abdominal operation for other than pelvic trouble, I had the privilege of seeing and examining the pelvis and was astounded at the perfect results and the normality of the pelvic organs.

Again let me quote from the excellent paper of the great Dr. Matas, of New Orleans:

"Personally I would express my conviction in regard to the superiority, of radium, by saying, that in case of one of my family, my wife, my daughter, or some one over whom I had authority, or for whom I felt a direct responsibility, I would unhesitatingly look to radium as my first choice.

Second. The second group of cases to which I wish to call your attention is that very large group of cases characterized by Menorrhagia—Metorrhagia, and Dysmenorrhea without demonstrable Neoplasms, Myomatous changes or Polypi. These Menorrhagic cases may have their causative factors:

(1) In an underlying cause, dependent upon the endocrin activity of the ovary, and influenced by other endocrin organs as well.

(2) A nervous mechanism, essentially vasomotor in nature, and

(3) The Uterus, and especially the Endometrium. In addition the state of general health also exerts an influence upon the function of menstruation.

Whether these bleedings are dependent upon (1) General or constitutional condition, (2) Anatomic states, (3) Functional or internal secretory dysfunctions, (4) Nervous states—or all of them, these women come to you as invalids or semi-invalids, asking relief. Many of these cases are from 25 to 45 years of age, nervous and physical wrecks, with intractable and exceedingly painful Dysmenorrhea—unmarried many of them, having only five to ten comfortable days each month, living in a perfect nightmare of WHAT the next few days may bring, nervous and miserable semi-invalids showing nothing anatomically or grossly wrong. These are types of cases in which radium is the sovereign remedy, whether the condition is only a dysfunction or

due to granular Metritis or other Endometrial pathology not demonstrable, radium should be used.

We regret that the limitations of our paper at this time will not allow us to report individual cases and results. We have quite a series of this type. The results here have also been marvelous. The menstrual flow ceases, pain disappears, they take on weight. I have one case that gained 35 pounds in one year. Life is now real and happy, and these women in the prime of young womanhood are restored to health and happiness. Is it not worth the while?

In the above two series of cases in which artificial menopause is produced I am sure some of you are thinking of the after effects of the radium. We believe that the post-radium cases passed through the menopause as comfortably, if not more comfortable than the average normal woman. We are quite sure that we see very little, if any of the nervous, mental phenomena with the mental obsessions and obliquities of character that we so frequently see in the normal menopause, nor do we see nearly as much of that symptom over which many women dote so much, the omnipresent hot flashes. The possible explanation of this would be that but rarely in the use of radium the entire function of the ovary is destroyed. The most satisfying results that we have in the two above classes is the uniform gratitude of the patient, which after all is an excellent criterion of results obtained.

I have seen a number of these young women in class 2, who had submitted in years past to hystorectomy and ovariectomies by, to put it mildly, ill-advised surgeons, and they have fallen back into the hands of the General Practitioner, in many respects in a most deplorable condition, nervous, hysterical, all hope of motherhood gone, something that we should preserve and guard as a sacred thing in womanhood. As small doses of radium act by altering the Endometrium and Myometrium rather than by altering, destroying the ovarian function. Even if it should be necessary, which is rarely the case to use sufficient radium to permanently destroy the ovarian function how greatly is it preferable to a surgical operation for there is left at least hope of motherhood.

Third. There is another series of cases which concern the General Practitioner in young women with excessive bleeding without marked discomfort, but with great constitutional impairment from loss of blood with or without anatomic defects.

We are not including in this series young girls from 12 to 16, cases which nearly always respond to hyperdermic medication of Corpora Lutea and Ovarian Extracts, Glandular Therapy, etc. In these bleeding girls, past 20 years, who are constitutionally losing

more blood each month than they can possibly manufacture in the interval, we have seen a few of these cases who have been the rounds of physicians and surgeons and were advised an operation. In these cases even of young women small doses of radium properly applied stops the monthly period for a few months—lessens the excess flow and carries them along to perfect normal menstrual health. Of course in these young women radium should not be resorted to until all of our other well known measures for regulating the menstrual period should have failed.

Fourth. Another class of cases frequently seen in which radiation appeals to and concerns the General Practitioner, are the various superficial cancers, and the allied conditions such as Lupus, and the semi-malignant Keratoses, and like skin conditions. In all suspicious skin conditions, especially on the face, delay is often disastrous. Radium is a specific and its administration so spectacular in its results that every practitioner should appreciate its benefits.

The Angiomata, the vascular tumors whether capillary, venous, cavernous or erectile or the mixed varieties are greatly benefitted by radium. In Nevi, or birth-marks that disfigure so many pretty faces radium is highly curative, and is not only effective in the above cases, but leaves none, or very slight traces of disfigurement.

We submit as part and parcel of this paper a series of Uterine cases, all of the non-cancerous are living and in good health. This list does not include the large number of advanced and inoperable cancers, in which cases radium was used only as a palliative remedy, hoping to make their last days more comfortable, and I believe in practically all of these cases in which it was used the patients were made more comfortable and their lives comfortably prolonged. I think in these cases too, it was worth the while. I also herewith give you a resume of conditions in which we have had radium used in other parts of the body other than the Utero-Ovarian system.

IN CONCLUSION

1. Radium is a powerful remedy, which in the hands of competent men is capable of being a tremendous help to the General Practitioner which can restore many invalid and semi-invalid patients to perfect health and thereby promote the reputation of the physician.

2. Radium and x-ray is an effective remedy when used scientifically by capable operators—in many cases which formerly required dangerous and major operations with their attending mortality and morbidity.

3. Radium in the hands of capable men given in proper dosages and given with proper care is a safe remedy with few serious reactions and complications.

All of the following patients treated by Drs. Keith & Keith.

Age	Date	Name	No. of treat.	Diagnosis	Size	Mgm. hrs.
41	1-5-25	Mrs. S. B.....	1	Uterine fibroid	4 mo. preg.....	1800
40	9-23-25	Mrs. A. I. C.....	1	" "	Small	1760
34	12-24-25	Mrs. P. E. G.....	2	" "	Small	1600
50	3-18-25	Mrs. H. F. W.....	1	" "	Small orange ..	1562 ½
39	8-28-25	Mrs. C. H. H.....	1	" "	3 mo. preg.....	1800
51	1-7-26	Mrs. A. T. C.....	1	" "	4 mo. preg.....	1800
45	2-7-27	Mrs. W. H. C.....	1	" "	.....	1800
42	4-26-26	Mrs. M. J. F.....	4	" "	2 mo. preg.....	800
36	6-30-27	Mrs. C. G.....	2	" "	Small	2700
44	12-13-26	Mrs. T. A. I.....	2	" "	2 ½ mo. preg....	2500
51	5-5-27	Miss F. J.....	1	" "	Small grapefruit..	1800
44	2-15-26	Mrs. P. K.....	3	" "	Small	3400
52	5-1-26	Mrs. F. W. W.....	2	" "	Small	1750
43	6-13-27	Mrs. E. H. B.....	2	" "	Small	3550
67	7-9-28	Mrs. C. B.....	3	" "	Tennis Ball.....	5400
36	1-22-26	Mrs. M. F. F.....	2	" "	Small	1750
47	1-31-28	Mrs. J. C. F., Jr.....	1	" "	Small	1850
35	1-11-26	Mrs. H. H.....	1	" "	Medium	1000
43	1-19-28	Mrs. J. M. L.....	1	" "	Small	1800
35	8-6-23	Mrs. C. E. P.....	3	" "	.....	2700
43	7-24-22	Mrs. L. M.....	3	" "	Orange	2025
42	3-22-27	Mrs. J. N. L.....	1	" "	Small	975
44	5-2-21	Mrs. H.....	3	" "	Multiple nod.	1450
43	6-28-22	Mrs. G.....	2	" "	.....	1000
39	10-2-22	Mrs. S. F.....	.....	" "	Nodular	1600
42	9-5-23	Mrs. H. G. W.....	1	" "	Nodular lemon....	950
47	5-5-23	Mrs. S.....	2	" "	Orange	1700
40	7-12-23	Mrs. R.....	2	" "	Grapefruit	1800
42	8-27-23	Mrs. H.....	2	" "	Grapefruit	1800
39	10-9-23	Mrs. H.....	1	" "	Small	1000
46	7-7-23	Mrs. A. P.....	2	" "	Small lemon	1600
51	7-13-27	Mrs. B. C.....	1	" "	Orange	1000
	1-26-22	Mrs. E. B. P.....	1	" "	Large gr. fruit... depth of ut. 10 in.	1600
33	9-20-22	Mrs. H. S. M.....	1	" "	.....	300
36	1-8-23	Mrs. A.....	2	" "	Small	1250
40	9- -23	Mrs. C.....	4	" "	.....	3800
40	4-4-27	Mrs. C.....	2	" "	Small	1250
34	9- -24	Mrs. J. D.....	4	" "	.....	3400
61	5-21-22	Mrs. T.....	2	" "	(Ca?)	2000
39	4-13-23	Mrs. F.....	2	" "	Small	1475
40	4-23-23	Mrs. C. H. S.....	1	Uterine Fibrosis .....	.....	1000
40	8-3-23	Mrs. W. C. E.....	1	Fibroid-Erosion of Cervix.....	.....	800
46	4-12-22	Mrs. J. A. L.....	3	Goose neck cer. fibrous prolapse.....	.....	1400
43	10-17-22	Mrs. W. G. S.....	1	Uterine fibrosis .....	.....	1700
22	2-12-26	Mrs. O. D.....	1	Cystic ovary-menorrhagia .....	.....	250
47	10-20-23	Mrs. C. A. S.....	3	Endometritis-Nod. fibroid .....	.....	3600
28	5-12-24	Miss F. H.....	1	Menorrhagia .....	.....	1200
50	6-6-22	Mrs. W. F. Y.....	3	Pre. cancerous cervix.....	.....	2850
42	7-22-24	Miss J. McA.....	1	Menorrhagia .....	.....	950
51	1-4-26	Mrs. E. M. R.....	5	Pre. Cancerous cervix.....	.....	3625
42	6-4-23	Miss B. O.....	2	Cystic Cervix .....	.....	2000
55	5-13-22	Mrs. W. J. W.....	2	Pre. Cancerous Cervix.....	.....	2000
45	7-22-24	Mrs. J. C. M.....	5	" " "	.....	4700
45	5-27-24	Mrs. J. L. G.....	6	" " "	.....	6200
40	4-19-23	Mrs. J. E. H.....	5	" " "	.....	4700
47	2-6-24	Mrs. R. E. P.....	5	" " "	.....	4700
52		Mrs. P. D. S.....	5	" " "	.....	4300
40	12-3-22	Mrs. W.....	6	Carcinoma Cervix .....	.....	4900

Age	Date	Name	No. of treat.	Diagnosis	Size	Mgm. hrs.
50	6-6-22	Mrs. W. F. Y.....		Carcinoma Cervix		4900
52		Mrs. W. L. M.....	4	Car. Body of Uterus.....		2800
58	1-28-26	Mrs. R.....	4	Carcinoma Cervix		3400
49	5-27-26	Mrs. S.	6	Carcinoma Cervix		5500
28	9 20-26	Mrs. A. M. H.....		Carcinoma Cervix (Oper.).....		1200
56	2-7-27	Mrs. J. A. H.....	7	Carcinoma Body of Uterus.....		5200
40	2-7-28	Mrs. P. R.....	5	Carcinoma of Cervix.....		4700
40	4-20-28	Mrs. G. C. S.....	6	Carcinoma of Cervix		4900
45	2-2-27	Mrs. H. F. M.....	4	Ca. Cervix-Uterine fibroid.....		4000
68	3-27-23	Mrs. H. J. C.....	5	Ca. Cervix		3000
65	11-5-23	Mrs. M.....	4	Ca. Cerv. Stump.....		3000
40	10-5 23	Mrs. S.....	9	Ca. Cervix-Fibroid		9575
54	9-6-22	Mrs. E. W. P.....	5	Ca. Cervix		4700

I also would like to add to the attached statistics the following miscellaneous lesions other than those included in the classification of my paper. In most of these conditions positive results were obtained, and in all of them some palliative improvement was seen sufficient to warrant the use of the Radium as a palliative measure. In this list also the Radium was administered by Drs. Keith & Keith.

Pigmented Moles	8
Epithelioma	15
Papilloma	2
Lip	3
Nevus	3
Hemangioma	2
Carcinoma of sigmoid.....	1
Multiple skin sarcoma.....	1
Tongue	1
Breast	1
Sarcoma hand.....	1
Chondrosarcoma hand.....	1
T. B. Adenitis.....	1
Carcinoma thyroid.....	2
Metastatic abdom. malig.....	1

In the pelvic cases many of them have been listed under Dysmenorrhea, Menorrhagia, and Uterine Fibrosis. In the cases given in detail no one mentioned has been repeated. The numbers referred to are patients and not to the number of diagnosis, as some of them had three diagnosis such as Dysmenorrhea—Menorrhagia—Endometritis—Uterine Fibroid, and Cervical Erosion.

DISCUSSION

D. Y. Keith, Louisville: I am sure we are grateful to Dr. Boggess in giving us a paper that is well worth while. He has had a large enough series of cases to be able to tell us what has happened in each individual case. He has given us much more information than any man would be able to give who is doing radiation therapy, simply because a great many of the patients will return to the doctor from whom they originally came. Many of the cases treated by the Radium therapist are out of town patients and reports by letter are not as satisfactory as personal contact.

The chart for radium has been very well outlined and we recognize it as the most powerful agent at our command.

There are three or four conditions of which I should like to speak, emphasizing them more fully than Dr. Boggess has done. In the cancers of the cervix, of which he first spoke, I think it is conceded by most of the physicians of the country, particularly in the larger clinics, that radium is the element of choice in all cases except where the diagnosis is uncertain. In the suspicious cases in which you elect to do a hysterectomy an intracervical application of radium should be given and followed by the complete operation in one to three week's time. In these cases no vaginal application is to be given as it renders the operation more difficult. If you are giving a malignant case a dose of radium and expect to do surgery you must do it pretty early before fibrosis has occurred. In this way no difficulty is experienced in the surgical procedure by the use of radium. In those cases we give about a fifty per cent of a so-called carcinoma dose of radium.

In the cases in which you can make a diagnosis from observation and your clinical history, or by taking a section without disturbing your tumor very much, we feel radium is the choice of procedure. We have not treated any uterine fibroids that are very large, unless there is some definite contraindication for surgery. Dr. Boggess referred to one patient who is a chronic cardiac case with a uterine fibroid that very nearly filled the whole abdomen. There was nothing else to do with any degree of safety. Enough reduction in the size of the tumor was obtained to make her comfortable. She was entirely freed of her bleeding and is satisfied.

The other type of case which he did not bring out fully is the patient with a fibroid wedged down in the pelvis, in which a great deal of bleeding has occurred accompanied with anemia. That patient is a hazardous risk so far as surgery is concerned. In this particular type of case where you have large nodules the size of your fist of the subperitoneal type, you can give a dose of radium that will check the hemorrhage and in six or eight weeks she is transformed from a poor surgical risk to good surgical risk.

This is one type in which we think radium is not used as often as it should be. We will get enough reduction in the size of the tumor for the patient to get relief from her pressure symptoms. You are using radium in a case of this kind to improve your risk only.

One year ago we treated a woman twenty-eight years of age, who had a large bleeding fibroid. The patient was almost exsanguinated. She had a pulse of 140 or 150 and a hemoglobin of sixteen per cent. I am sure anyone would hesitate about operating on a patient of this type. She was given an application of radium and the following morning was given a blood transfusion. Four months later a hysterectomy was done. She was made a good surgical risk. Today she is perfectly well. I am sure a patient of that kind could not have been saved with any other procedure. The uterus was very small, not larger than six weeks pregnant uterus, with a fibroid the size of a child's head coming from one side. Very little reduction was expected of the tumor of the uterus in this four months' period, but she had relief of the bleeding and recovered from her anemia and was made into a good surgical risk.

In the dysmenorrhea and in the menorrhagic cases or the constant bleeding cases above thirty-five years of age in which by bimanual examination you can find nothing, radium is almost ideal resulting in cures in all cases with little or no loss of time. The relief obtained in these patients is almost unbelievable. All of our cases of this type are treated without the use of anesthesia except in the unmarried patient, and the ones who have not borne children. In these cases we are not able to find any pelvic pathology, the uterus is small, the uterine canal from 3 to 6 cm. in depth and as a rule no curettment is attempted.

We have been very careful not to use radium on any case that has given a history of inflammatory pelvis at any time, whether it be chronic, sub-acute or acute.

Personally, we do not believe that the deaths that have been reported have been the result of radium. They have been due to the trauma in the uterus and so-called thorough curettment, a lighting up of pelvic cellulitis follows with or without the use of radium. These cases have refused operation and we refused to use radium for we are able to control the bleeding as a symptom by x-ray alone. Some of the men in the larger clinics have reported the application of radium externally and have results just the same as you would get by placing a small dose of radium in the uterus.

In young girls from sixteen to twenty-four years of age the results are ideal. You should be exceedingly careful about your dosage. One of the first cases that we treated was cured with forty-seven milligram hours of radium. A larger dose was intended but a faulty timepiece

caused an early removal. Since that time we have had very few patients of this character that have received more than 250 milligram hours of radium. Several have borne normal children. Before this accident occurred, we were giving around 400 to 600 milligram hours. We prefer as small doses as possible and as long as good results prevail we shall continue to use minimum doses.

Irvin Abell, Louisville: I should like to discuss the paper from the standpoint of the surgeon, and in doing so to commend everything that Dr. Boggess and Dr. Keith have said.

With a rather long experience in treating the conditions which have been mentioned in the paper, I have come to the conclusion that radium will do all that the two gentlemen have indicated. It is not as efficient a measure, possibly, as we had thought it would be when it was first introduced, but it will undoubtedly accomplish better results in certain classes of cases than any method of treatment heretofore employed.

I will confine my remarks to cancer of the cervix, cancer of the body of the uterus fibromyomata, and uterine bleeding. Having observed the effect of radium upon large growths of the cervix we have not operated by choice on any cancer of the cervix since 1920, in which a diagnosis had been made. We inadvertently removed four in doing hysterectomy for other conditions in which we had not suspected cancer of the cervix to be present, learning of its presence only from the microscopical examination. Since 1921 we have routinely treated cancer of the cervix with radium.

Last year, in making a follow-up of the cases which had been so treated we found that we had very much better results with radium than we ever obtained in doing hysterectomies for cancer of the cervix. We have two patients treated in 1922 who are still living and well; we have four patients treated in 1923 who are still living and well; we have four patients treated in 1924 who are still living and well, and from that time to the present an increasingly greater number.

Radium obviates the three factors that make for mortality in operations for cancer of the cervix, prolonged anesthesia, prolonged trauma, and blood loss. With radium treatment the mortality is practically nil, and the morbidity is certainly very much lessened.

In treating cancer of the body of the uterus, personally I believe hysterectomy preferable to radium. It is a difficult matter to apply the radium in sufficiently massive doses to the body of the uterus to obtain satisfactory results. We have limited our treatment of cancer of the body of the uterus by radium to those patients in whom a major operation was contraindicated, whether by obesity, by hypertension, by cardiovascular disease, or other serious lesions. We were able to trace eleven of the patients in this group.

We found we had two living and well, six and two years after application; we had two living, with evidence of recurrence, also six and two years after application; seven of the patients were dead. Considering that in this group it gave an appreciable prolongation of life, we feel that is the method of choice only where major operation is contraindicated.

In the fibromyomata of the uterus, we have limited our use of radium largely to the patients who do not present massive tumors, tumors the size of four months' pregnancies, or greater, those in which there is no marked nodulation, those in which there is no marked submucous development of the myomatous growths, those in which there is no calcareous or other degeneration, those in which there is no infection in the tubes and no ovarian neoplasms. When you consider those contraindications, you realize that as a surgeon we take a good many of the patients with fibromyomata out of the radium class.

It has been our experience that fifty to sixty per cent of the uterine myomata that come under observation will present one or more of these conditions. If none of these is present and the patient is not too young, we prefer radium to the employment of hysterectomy. In the younger patients (and we have them, in the twenties and in the thirties), we prefer operation, for the following reasons: it will occasionally permit of a myomectomy and the retention of fertility; we have patients so treated and who have subsequently married and borne children, or, if married, have later borne children. The possibility of doing myomectomy cannot always be determined, I grant you, until the incision is made and the location and number of the growths determined, but where they can be removed and fertility preserved, I think that to be a desirable procedure.

Secondly, in using radium in sufficient dosage to produce shrinkage or disappearance of the myoma, one destroys the ovarian function. In young women I believe operation is better since the preservation of the ovarian function is a worth while thing.

Personally I believe the uterine bleeding known as myopathic, metropathic and idiopathic to be a hyperfunction of the ovary, for the reasons that the curet in each instance will show a hyperplastic type of endometritis, that it very frequently recurs after curettement and that the ovaries in such cases show a large number of maturing follicles with an absence of corpora-lutea.

Dr. Keith referred to a series of cases that we had curetted some several times and in which we ultimately had to do a hysterectomy to control the bleeding. Fortunately radium has rendered such operations in this class of cases no longer necessary.

The cause of such bleeding must be hyperfunc-

tion of the ovary, and there is no agent at our command which will so radically or satisfactorily control this as the application of radium.

We were able to follow seventy-two of our cases treated in this way. Some of these have borne children; two of them reported back to us for recurrence of the bleeding; three of them reported to other clinics for recurrence of the bleeding; while in the remainder the result was all that one could possibly desire. As I state, I know of no other method of treatment which would give as good results.

W. F. Boggess, Louisville, (in closing): I very much appreciate the discussion. I think I can agree with Dr. Abell and I think he will agree with me. I have seen four cases of cancer of the cervix after subtotal hysterectomies. I have seen one thirteen years after the subtotal hysterectomy. I cannot say, and I doubt whether anybody can say, if in these fibroid and fibromyomatous uteri in which you take out all except the cervix, radium lessens the tendency or the possibility of the development of cancer in the future. I wonder if it doesn't. That is only a theory, of course. I think we feel there is a tendency of many of these so-called myomatous conditions to become malignant and undergo degenerative changes—we don't know what they are.

I believe in the use of radium with no mortality and little discomfort, the mortality and morbidity of surgical operations must be considered, which, in the hands of our very best men I think is about two per cent, in the hands of less capable men a good deal higher. The long time of convalescence and the long period at the hospital must be considered. How much better it is to have something that lays them up just a few days.

In the series that we present, running over a period of six or eight years, we have had not one case that has shown any effects other than good ones: there have been no complications, and the patients are comfortable and happy.

I think there are a great many other conditions in which radium can be used. In those cases in which the menopause has been produced, I don't believe we have as much discomfort as we do in many of our normal cases.

Magnesium Salts Treatment of Cancer.—Barbarin used magnesium salts (magnesium chloride) in the treatment of cancer for thirty years but cannot report any case of cancer cured by their exclusive use. He considers the surgical treatment the basic treatment of cancer and the magnesium therapy only a valuable auxiliary, because it slows the evolution of some cancers, especially cancer of the breast and of the digestive tract (with the exception of the liver), checks the hemorrhages, and ameliorates the recurrent ulcerations.

SCARLET FEVER: A RESUME*

By FREDERICK G. SPEIDEL, M. D., Louisville.

The use of vaccines and sera in the prevention and treatment of disease dates from the introduction of diphtheria antitoxin by Behring in 1893, and from the application of antityphoid vaccination by Wright in 1896. The success of both of these remedies has firmly established them as invaluable agents in the therapeutic armamentarium, and has served to point the way to the development of similar products for the prevention and treatment of other diseases.

Although the incidence of scarlet fever is considerably less than is that of measles, it is a disease justly dreaded by parents and physicians. The mortality varies greatly in different epidemics, but the general average is estimated as one death in every eight cases, and, in young children, one in four. Moreover, in addition to the severity of the uncomplicated disease, there is a marked tendency for the development of complications and sequelæ, notably intense angina with septice-mia, middle ear disease, cervical adenitis and nephritis.

Up to the time when George and Gladys Dick began their epoch-making work in 1912 experimental scarlet fever had not been produced. Atypical rashes, or fever and leukocytosis had been described in animals following inoculation with different materials of scarlet fever origin; but these had been inconstant. No one had obtained symptoms sufficiently typical to justify the designation of experimental scarlet fever.

Besides the variations in the streptococci associated with scarlet fever, and the failure to produce the disease experimentally, the lasting immunity usually conferred by one attack was not considered characteristic of streptococcus infections.

The production of experimental scarlet fever remained the essential step in the determination of the etiology of the disease. In order to learn if it is possible to obtain an acceptable scarlet fever in laboratory animals these were inoculated in the throat, subcutaneously, intraperitoneally, and intravenously with fresh blood serum, blood plasma, whole blood, throat mucus, and urinary sediment from early cases of scarlet fever, and with macerated skin scales from desquamating cases. They were also inoculated with ground tonsils, lymph glands, and spleens obtained as soon as possible after death. It was reasonable to believe that in some of the inoculations, each species of animals used had received material containing the specific organism of scarlet fever. The negative results of these experiments led to the conclusion that laboratory animals are comparative-

ly insusceptible, and that it would be necessary to use human volunteers for the production of experimental scarlet fever.

Many attempts had been made to produce scarlet fever in man. The successful inoculation of smallpox had led to the hope of a like success from the inoculation of scarlet fever. Erasmus Darwin, the grandfather of Charles Darwin, had urged the medical profession to undertake such inoculations in the hope of discovering a method of preventing more severe attacks. Inoculation experiments in man had been made with material from erythematous areas, serum from milial vesicles, skin scales, and blood from scarlet fever patients without success. Accidental inoculations of human beings had been described but they had occurred under conditions that threw no light on the etiology.

Even with human volunteers, it was not expected to obtain experimental scarlet fever readily for it was known that less than one-half of the persons exposed contract the disease.

However, in a series of volunteers a case of typical scarlet fever was obtained by inoculation with a pure culture of a hemolytic streptococcus isolated from a lesion on the finger of a nurse who acquired the disease while caring for a convalescent scarlet fever patient.

This was the first case of scarlet fever produced experimentally by the inoculation of a pure culture of any organism. It was reported October 6, 1923 by George and Gladys Dick. The requirements of Koch's laws have now been fully met, and we are justified in concluding that scarlet fever is caused by the hemolytic streptococcus.

Since the hemolytic streptococcus is found in the throat and is only seldom present in the blood, it is evident that the rash of scarlet fever is not produced by the direct action of the streptococcus on the skin. It was still important to learn by what means the streptococcus, growing in the throat causes the rash.

It was found that the scarlet fever streptococci produce a toxin. When this toxin is absorbed into the blood, it produces the rash.

The toxin is obtained by inoculating plain broth with the strains of streptococci that produced experimental scarlet fever in human beings. A small amount of blood is usually added to the broth at the time of the inoculation. After incubation, the broth cultures are passed through porcelain filters to remove the bacteria. The filtrate is cultured for sterility, and kept in a refrigerator.

When suitable amounts of toxin are injected into susceptible persons, it may cause a reaction characterized by general malaise, nausea, vomiting, fever, and a generalized scarlatinal rash. In other words, the sterile

*Read before the Jefferson County Medical Society.

toxin, alone, is capable of producing the characteristic symptoms of scarlet fever, including the rash.

These symptoms appear within a few hours after the injection of the toxin, and disappear within forty-eight hours.

If horses are immunized by subcutaneous injection of gradually increasing doses of sterile scarlet fever toxin, they produce an antitoxin capable of neutralizing the toxin.

This serum is concentrated by the same method employed for the concentration of other antitoxic sera.

The resulting product is of high potency, and the serum reactions that it causes are so few and mild that they do not interfere with its routine use in the treatment of scarlet fever, or with its prophylactic use.

Credit rightfully belongs to Dochez for having first produced an antitoxic horse serum against the scarlet fever streptococcus, and for having tested its capacity to neutralize the rash locally in the skin in human cases of scarlet fever. Credit must also be given to Dochez for having demonstrated with the cooperation of Blake, the clinical value of the serum in the curative treatment of scarlet fever.

Scarlet fever streptococcus antitoxin has three uses; first and foremost is its therapeutic use in the treatment of the disease; second, it may be used under certain conditions as a prophylactic measure, and third, is its diagnostic use by the blanching test.

To secure an immediate immunity, the antitoxin can be used by subcutaneous injection even as in diphtheria, but here also this passive acquired immunity probably lasts only two or three weeks at the most. For more permanent immunity much work has been done with injections of scarlatinal toxin. This poison has a much less destructive effect on tissue than has diphtheria toxin and accordingly it does not need to be modified as by the addition of an antitoxin, before its injection. A disadvantage, however, lies in the fact that such large doses as are effective are liable to produce certain of the toxic symptoms of scarlet fever itself, including fever, vomiting, strawberry tongue, and especially a rash, so that in the presence of an epidemic it becomes impossible to say whether or not the exposed child, to whom the toxin has been given, is merely showing a reaction to the injected toxin or, on the other hand, is a victim of the disease itself.

The blanching test or Schultz-Charlton phenomenon has been made use of to differentiate the rash of scarlet fever from the eruptive characteristics of other infectious diseases such as confluent measles, typhoid fever, influenza, and the drug rashes. This test is carried out by injecting intradermally 0.1 to

0.2 c.c. of antitoxin at a point where the eruption is most intense. After six to twelve hours, the rash, if it be due to scarlet fever, is definitely and completely blotted out in the zone of varying size surrounding the point of injection. The area is usually oval in shape with clearly defined edges and within this zone the raised points of the eruption disappear and the skin becomes smooth. The blanched area persists throughout the disease and is protected from desquamation. In other words, there is actually a local cure in the blanched area due to neutralization of the toxin in the tissues by the antitoxin which is injected. The most favorable time for obtaining the blanching phenomenon in scarlet fever is during the second day of the eruption.

One important point that has been brought out in the more recent investigations is that the disease is not transmitted through the skin, for the scales during the desquamation stage do not carry the infection as was long supposed. The disease is transmitted only through air-borne droplets of saliva or nasal discharges, or by contact with articles soiled with saliva, nasal secretions or the discharge from some secondary complications, such as otitis media; or through contaminated milk.

For some years, there has been discussion as to whether scarlet fever patients with discharging, suppurative lesions should be quarantined until all discharges are stopped; or whether these lesions should be regarded as due to secondary invaders, and the patient released at the end of the usual period of quarantine.

Since hemolytic streptococci are present in the discharge, and scarlet fever is now known to be caused by hemolytic streptococci, the question narrows to a determination as to whether or not the organisms present in the suppurative lesions are the primary invaders, or some different, and non-specific type of streptococcus. The Dicks have had an opportunity to test a small series of hemolytic streptococci isolated from suppurative lesions in scarlet fever and found them to be specific toxin producers.

It is the opinion of the writer, that all cases of the disease with a bright rash should be treated with antitoxin. In very mild cases seen on the third and fourth day, if the rash is clearly fading, antitoxin treatment may be withheld. In late cases with fading rash, slight benefit may be expected; and if the rash has faded no benefit may be expected from antitoxin treatment.

With adequate dosage, the results of antitoxin therapy are striking. Treatment should cause within twelve to eighteen hours a marked subjective improvement, critical fall of temperature and pulse, and fading of the rash. If the rash is old, the bright blush

should disappear, but pigmentation will remain.

Little or no direct effect from antitoxin treatment may be expected on the course of septic complications. These are presumably indirectly benefited by curing the patient of the specific toxemia. Possibly the extension of septic processes may be checked by an antitoxin which also contains antibacterial bodies.

The use of scarlet fever antitoxin for prophylaxis is not advised except in unusual circumstances; because (1st) the immunity is at best of only two to three weeks' duration; (2nd) the incidence of infection after exposure is only about 20 per cent; and (3rd) where infection is expected the disease can be cured on the first day by antitoxin treatment.

As an example of the use of scarlet fever antitoxin for prophylaxis the following circumstance which occurred in August, 1926, is cited. On July 28th, 1926, C. L., a boy, age 7, was admitted to the Kosair Crippled Children's Hospital with diagnosis Talipes Equino Varus (left) resulting from infantil paralysis. On August 4th, after being in the hospital for 4 days and being in intimate contact with the other 47 children there, he developed scarlet fever. He was immediately given a full therapeutic dose of scarlet fever antitoxin and was removed to the isolation ward of the City Hospital. Skin tests for susceptibility were made immediately upon all children in the hospital. Thirty-five were found to be immune to scarlet fever and 12 were found to be susceptible. All susceptible children were then given a prophylactic dose of antitoxin. No other cases developed in the hospital and the child, who had the disease, was returned from the City Hospital Sept. 7, 1926, completely recovered.

The following example of the therapeutic use of scarlet fever antitoxin may be mentioned. B. S., a boy, age six, became ill with scarlet fever on March 4th, 1928. I first saw him on March 5th, 1928 at which time he had a well developed case of scarlet fever, lobar pneumonia in the left lower lobe, a dry pericardial friction rub and albuminuria with many hyalin and granular casts. This child was immediately given a full therapeutic dose of scarlet fever antitoxin. Within 24 hours the rash was practically gone, his temperature was considerably lower and the inflammation of his throat was subsiding rapidly. It is believed that the prompt neutralization of the scarlet fever toxemia in this case was largely responsible for this child's subsequent complete recovery from his pneumonia and pericarditis.

DISCUSSION

James W. Bruce: I have enjoyed Dr. Speidel's paper, it is comprehensive, and covers the most

modern thought on the subject of scarlet fever. There is much difference of opinion as to the treatment of this disease. One of the pediatric societies of the South a few months ago when the question was raised went on record as advising the administration of antitoxin in every case of scarlet fever no matter how mild. At that time several of us expressed the belief that this was a mistake. Personally I certainly think it is. I do not believe the ordinary case of scarlet fever is sufficiently benefited by antitoxin to incur the risk of reaction as in many cases the reaction is very severe. In moderately severe and toxic cases it seems to me antitoxin is indicated and does much good. As an illustration: two years ago I saw a boy, aged three years, with a very severe attack of scarlet fever; he had membrane on both tonsils, enlarged cervical glands, typical rash, extremely toxic, temperature 104° F., and the outlook was decidedly unfavorable. We gave him two therapeutic doses of antitoxin. The next day fever had receded and the child felt better. The third day he was worse again and we gave him another therapeutic dose of scarlet fever antitoxin and in addition 20,000 units of diphtheria antitoxin. Improvement was noted the following day and the child made a perfect recovery. There were no complications except a cervical abscess, which had to be incised. I believe scarlet fever antitoxin in that case saved the child's life.

I was much surprised at the recent A. M. A. meeting in Minneapolis, to hear a report made by Dr. John Toomey, who is at the head of the Cleveland (Ohio) City Hospital, Contagious Diseases Division, on several thousand cases of scarlet fever, one-half of which were treated with antitoxin and the other half not. He found in this large series of cases that the mortality was practically the same in those treated with antitoxin and those that were not. He stated that the disease was shortened about one day by the administration of antitoxin so far as rash, toxemia and fever were concerned. We know that statistics are sometimes deceptive to a certain extent, and we have to judge the results obtained by our own clinical experiences, but these figures surprised me very much.

As to passive immunization with scarlet fever antitoxin, I agree with Dr. Speidel that this is to be avoided if possible. Of course, in institutions where many children are in intimate association with each other everything possible must be done to prevent spread of the disease. It is remarkable how few cases of scarlet fever are transmitted to other members of the family. In the case I just cited, the boy was one of eight children; these children played together before the diagnosis was made and none of the others developed the disease. So it appears that scarlet fever is not as contagious as we have thought it was.

In regard to active immunization, there has

been given this phase of the subject a great deal of study, and there is a strange variance of opinion in different parts of the country. I was somewhat surprised at the Minneapolis meeting to hear they were losing faith in Larson's preparation which received so much thought and confidence two years ago. This preparation was devised by Prof. Larson of the University of Minnesota Medical School and has been used very extensively around Minneapolis, but I understand many of the men in that part of the country have lost faith in it. The five injection series recommended by the scarlet fever committee is probably more effective, but it has serious objections. One of the objections is that five injections are necessary in patients shown to be susceptible to scarlet fever, and we do not even then know how long the immunity will last. Probably the immunity is of long duration, but we cannot be certain of this. Moreover, the reaction from the five injections is sometimes quite severe. I have seen some reactions as severe as the average case of scarlet fever. I have been using the method from time to time, but it seems to me the reactions are too severe to warrant the procedure as a routine method.

James H. Pritchett: The essayist has covered the subject so thoroughly that there is little further to be said. About a year ago I was very enthusiastic regarding the use of scarlet fever antitoxin. In February, 1928, issue of the Kentucky Medical Journal I published an editorial article advocating the use of antitoxin in every case of scarlet fever. I have now changed my opinion. I have had three or four cases in which the reaction following scarlet fever antitoxin was very severe, but all the patients recovered. Theoretically antitoxin is indicated in all cases, but in practical experience this is a much mooted question. Scarlet fever antitoxin has not reached the stage of perfection attained in diphtheria antitoxin, but we hope some day it will. You are all aware however, that years ago in the use of diphtheria antitoxin and toxin-antitoxin we had quite a number of reactions. Many such cases were reported from various parts of the country. There is no question that the administration of scarlet fever antitoxin is advisable in certain cases, especially the so-called malignant cases with high fever, severe angina, glandular enlargements, etc. In some of these severe cases the symptoms subside almost immediately after the administration of antitoxin. I have in mind a severe case of scarlet fever in a child four years old seen in May of this year. The child was given two therapeutic doses of antitoxin and made a satisfactory recovery within a few days. In due course of time the father of this child developed the most intense case of scarlet fever that I have ever seen. He was desperately ill, temperature 106° F., and he became almost moribund. He was removed to the city hospital and placed in the isolation ward.

He had then been ill for four or five days. We gave him immediately an injection of 10 to 20 c. c. scarlet fever antitoxin followed by improvement within a few hours. The next day he received a second dose of antitoxin. The effect was marvelous in this case, all symptoms disappeared within forty-eight hours and he made a satisfactory recovery.

I happen to know that Dr. Palmer has had considerable experience in the management of scarlet fever in the city hospital and is familiar with the details of antitoxin administration here. It would be interesting to have him tell us something about his observations in the hospital.

George W. Twomey, Tientsin, China: I have enjoyed Dr. Speidel's paper and the discussion. We have scarlet fever in China and among foreigners it is one of the most dreaded diseases we have to combat. Among the Chinese the disease is not particularly severe, although in foreigners it is very severe and the death rate is exceedingly high. We attribute the discrepancy to the fact or the theory that any disease transmitted from one race to another has a tendency to be more severe. Strange as it may seem to you, the majority of the cases of scarlet fever we see in the Orient are among adults. This is due to the fact that there are comparatively few children, especially among the foreign population. However, when the disease occurs in children, the death rate is very high. Otitis media, cervical adenitis and nephritis are particularly common complications.

Our practice in China is to administer antitoxin in all cases and to do so early if possible, but if we do not see the patient until late in the course of the disease we give antitoxin anyway. If there is no improvement in twelve to eighteen hours, we administer a second dose. We have occasionally had some rather severe reactions, but in spite of these we have thought the end justifies the means, and that it is better to administer antitoxin than to allow the patient to go without it.

J. Rowan Morrison: I have enjoyed Dr. Speidel's splendid presentation. The scarlet fever that I see now is much milder comparatively than the cases seen in the earlier years of my practice. There is considerable difference of opinion among physicians as to whether scarlet fever antitoxin should be administered in every case. No definite rule seems to have yet been formulated about that phase of the subject. Some of the cases of scarlet fever we have seen this spring have been so mild that we did not know they were scarlet fever except by general supposition.

A lady brought her young daughter to my office saying she expected to leave shortly for Europe and asked me to give the child a prophylactic dose of typhoid-paratyphoid fever antitoxin. I refused to administer the antitoxin at

that time as the child had symptoms indicating a mild attack of scarlet fever. Another physician saw her in consultation the next day and said he did not know whether she had scarlet fever or not. The child had a temperature of 99° F. at the time. We concluded to keep her under observation and had her excluded from school. In due time her younger sister developed similar symptoms. I believe if we had given these two children horse serum the reaction or serum sickness would have been more severe than the disease.

In severe cases of scarlet fever, with marked symptoms, I think a therapeutic dose or two of antitoxin administered as early as possible may do a wonderful amount of good. In 1927 I talked with the same physician in the Cleveland city hospital as quoted by Dr. Bruce about scarlet fever antitoxin, and he gave me about the same statistics as Dr. Bruce has cited.

On account of the severe reactions I am now refusing to give prophylactic doses of scarlet fever antitoxin. A year or two ago when we were having some severe cases of scarlet fever in this community, I was in favor of this method; but not long afterward at a meeting in Detroit it was stated that many of the physicians had discontinued the three injection plan of prophylaxis on the ground that it was dangerous. I was particularly interested in what Dr. Bruce had to say about this and the views of other physicians throughout the country. Many of them are not much in favor of the five injection method, although others are very enthusiastic and are still using it.

James S. Lutz: I think the use of scarlet fever serum is very much like the administration of any other medicine, that is if we give it in every case we are going to make an error. However, in severe cases I believe it should be given. I have administered scarlet fever antitoxin to several patients who had very severe reactions.

I have not infrequently given prophylactic doses of antitoxin where one of several children in a family had scarlet fever. No case of scarlet fever has developed after an immunizing dose in my experience, but I have not given it in a sufficient number of cases to know very much about it.

A peculiar thing to me is that this year I have seen a great many cases of scarlet fever in adults. I was recently called in consultation where there were five people in the family, ranging in age from 15 to sixty-three, and they all had scarlet fever. I saw more cases of scarlet fever in adults during the month of March and the first week of April this year than ever before in my practice. Just at that time we were having an epidemic of influenza in Louisville, and I have wondered whether there might not be a close relationship between these

two diseases as they occur together so frequently.

I have enjoyed Dr. Speidel's paper very much.

Lee Palmer: There are several points about scarlet fever and its treatment that I would like to mention. I had four years experience in treating scarlet fever in the mountains of Eastern Kentucky, where, as you all know, the housing and hygienic conditions are extremely unfavorable. During that time I never saw scarlet fever antitoxin used and knew little about it except from my reading, and I read about as much against it as for it; so I was amazed when I came to Louisville last year and began work in the isolation ward at the City Hospital to see the wonderful results from the administration of scarlet fever antitoxin. In severe cases, with temperature ranging from 103 to 106, a marked rash, marked toxemia, and severe angina, the patient was given 10 c. c. of scarlet fever antitoxin (Squibbs) and within forty-eight hours it was hard to realize that he had had scarlet fever. The temperature reduced, toxemia was less marked, rash faded, angina subsided, the exudate on the tonsils began to disappear; the effect was wonderful. It was necessary, however, in some cases to repeat the antitoxin on the second or third day.

Another feature which impressed me was the difficulty in deciding which patient should receive scarlet fever antitoxin and which one should not. I have often wondered whether antitoxin should be administered in mild cases. I recall two patients, who came into the outpatient department with this history: One was a boy, aged 11, who came in because of generalized swelling. Two weeks previous to this time, his mother stated that he had had a slight sore throat, some headache, and was a little red, but there was no vomiting and very little, if any, fever. These symptoms were so mild that he did not go to bed. His physical examination showed marked edema of the entire body, and fluid in the peritoneal cavity. There was a thick desquamation of the palms of the hands and the soles of the feet. His urine showed albumin, casts and red blood cells. The blood pressure was extremely high. The blood chemistry was that of a typical case of nephritis. Thus we have a severe nephritis following a mild case of scarlet fever. Two days after admission the boy had complete suppression of urine, extremely high blood pressure and was in a state of coma. 50% glucose solution was given intravenously, with the result that he immediately began passing large quantities of urine. He came out of coma, was put on nephritic diet and finally recovered.

The second case presented a very similar history, very similar physical findings, and likewise had complete suppression of urine, high blood pressure and was in a state of coma; was treated with glucose (50%) intravenously, with a simi-

lar result to the above case.

Routinely in the City Hospital we give every patient with scarlet fever one to two doses of antitoxin as the condition requires. Investigation of the records of the isolation ward for 1927 and the first half of 1928 shows the following figures, which may prove interesting. There were 54 patients admitted, diagnosed scarlet fever; 46 of these were given antitoxin; serum sickness developed in 11, or 25%. Only one patient had a temperature from serum sickness higher than the highest temperature during the early symptoms of scarlet fever. The cases of serum sickness were controlled by the administration of adrenalin. Complications: One, mild nephritis, remaining in the hospital about 40 days. One mild otitis media, remaining in the hospital only 28 days, and one severe otitis media which had to be quarantined 54 days. Only two deaths during the 18 months, both of which occurred immediately after admission and neither had scarlet fever antitoxin.

A. M. Leigh: Dr. Speidel is to be congratulated on his excellent paper. Scarlet fever serum has been very disappointing in my hands. Three years ago when I first began using serum I was very enthusiastic about it, but very severe reactions followed which were really worse than the disease. I believe that has been the experience of quite a number of others.

The mild case of scarlet fever is the one most likely to be followed by nephritis, in fact, the only two cases of severe nephritis I have seen, followed mild attacks of scarlet fever that were not treated by a physician. In the majority of instances mild cases are the ones that give future trouble. The mother will think the child has nettle rash or digestive disturbances and she will not even call a physician. In three weeks, the child will develop nephritis and in the vast majority of cases will die. The mild or neglected case is in one most likely to be followed by complications.

Fred G. Speidel, (in closing): I wish to thank the members of the society for the liberal discussion which they have offered. Their remarks have proven both interesting and instructive to all of us, especially with reference to differentiating between mild and severe cases of scarlet fever.

The theory of the toxemia of scarlet fever is as follows: the hemolytic streptococci, which lodge and multiply in the throat, liberate an exotoxin which circulates in the blood. This exotoxin stimulates the production of an antitoxin which in turn reacts upon the bacteria disintegrating them and liberating an endotoxin, which is liberated and circulates in the blood, causing the rash and nephritis. In those cases which terminate in recovery without specific therapy this toxin is neutralized by a naturally produced antitoxin.

There is no way by which we can tell at the onset of a case of scarlet fever whether it will be mild or severe as we have no method of

measuring either the quantity or the toxicity of the toxin. We are surely not justified in assuming that a toxin which produces a mild rash and a mild degree of fever will also have only a mild effect on the heart, kidneys and other susceptible structures. For these reasons I believe that it is advisable to administer antitoxin to all patients with scarlet fever with the qualifications mentioned in the paper.

In so far as serum sickness is concerned, this is of relatively infrequent occurrence and will probably become even less frequent as methods of concentration of the antitoxic serum are perfected. Furthermore, when this contingency occurs it can be dealt with effectively as Dr. Palmer has stated.

As to the question of active immunization with scarlet fever toxin, I purposely did not consider this thoroughly in the paper because opinions vary so widely as to its effectiveness.

However, I think the discussion of this question this evening has presented it in its true light.

BOOK REVIEWS

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- VI. A Bipolar Interpretation of Certain Normal and Pathological Conditions.

WOMAN'S AUXILIARY NOTES

A contribution of \$25.00 has been received by the State Treasurer from the Jefferson County Auxiliary to help replenish the treasury of the Woman's Auxiliary to the Kentucky State Medical Association. This brings the total received to \$55.50, the contributing counties being, besides Jefferson, Garrard, Perry and Madison.

TAYLOR COUNTY ELECTS OFFICERS

The Woman's Auxiliary to the Taylor County Medical Society met March 21st and elected the following officers for the ensuing year:

President—Mrs. C. V. Hiestand.

First Vice-President—Mrs. Joe Cullison.

Second Vice-President—Mrs. W. B. Atkinson.

Secretary-Treasurer—Mrs. J. P. Godzer.

This progressive young organization has grown from seven to sixteen members during its first year. They are preparing for a children's clinic during April.

JEFFERSON COUNTY ELECTS OFFICERS

At their regular business meeting held on March 19th, 1929, at the Henry Clay hotel, the Woman's Auxiliary to the Jefferson County Medical Society, elected officers for the ensuing year as follows:

President—Mrs. D. A. Bates.

First Vice-President—Mrs. John K. Freeman.

Second Vice-President—Mrs. H. Arch Herzer.

Third Vice-President—Mrs. C. W. Jefferson.

Fourth Vice-President—Mrs. Duffey Hancock.

Secretary—Mrs. Roland L. McCormack.

Parliamentarian—Mrs. Philip Barbour.

On March 22nd an Easter egg party was held at the City Hospital for the entertainment of the children. On March 30th, an Easter party was given for the crippled children at the Kosair Hospital. Both of these parties were given under the direction of Mrs. L. W. Neblett, Chairman of the Hospital Committee.

MRS. D. A. BATES, Secretary.

OUR PRESIDENT TRAVELS

Mrs. J. T. Reddick, our president, spent the month of March and the early part of April visiting with her son and daughter in New York and Washington.

On her way back home to Paducah, Mrs. Reddick visited Mrs. A. T. McCormack, in Louisville, and met the newly elected officers of the Jefferson County Auxiliary together with the resident State officers, in informal conference, preparatory for the next Annual Meeting, which is to be held in Louisville, October 21st to 24th inclusive.

JANE TODD CRAWFORD MEMORIAL FUND

Two individual donations were made during March to the Jane Todd Crawford Memorial Fund. These were for fifty dollars (\$50.0) each from Mrs. J. N. McCormack and from Mrs. Irvin

Abell. All checks should be made payable to the Jane Todd Crawford Memorial Fund and sent to Mrs. W. G. Salisbury, Treasurer, Woman's Auxiliary, Kentucky State Medical Association, Puritan Apartments, Louisville.

THE STUDY COURSE

The "Study Course on the Medical and Health Laws" has been completed. It is hoped that you have profited from this study and that you will save the lessons sent you for future reference. They are valuable.

IN THE HOSPITAL

Mrs. J. W. Nolan, Harlan, Corresponding Secretary of the Harlan County Auxiliary, who has been ill since Thanksgiving, spent several weeks during March and April at St. Joseph's Infirmary, in Louisville.

IN MEMORIAM

All Auxiliary members will be grieved to learn of the death of Dr. S. P. Parks at Irvington, December 29th, 1928. Our sympathy and affection are extended to his bereaved widow, Mrs. S. P. Parks, who is President of the Woman's Auxiliary to the Breckinridge County Medical Society.

NEWS ITEMS

WILL REOPEN IN MAY

The New Highland Sanitarium located at Martinsville, Indiana, sustained a severe fire loss a few days since; but fortunately all of the 75 or more patients were removed without injury. The buildings comprised three units, the two wings being new brick buildings, five stories high. The fire broke out in the center occupied by the old Sanitarium building, destroying it completely. The windows and interior of the new brick building were badly damaged, the loss amounting to \$200,000.00. Dr. Simon P. Scherer, proprietor and medical director, announces to the Medical Profession that work has already begun on restoring both brick buildings which comprise an American plan hotel with sanitarium, baths and medical clinic, and he hopes to have the same in full operation again by May 1st. The original sanitarium building will not be rebuilt at this time. The two brick units will be operated as soon as the redecoration is completed.

Dr. Chas. K. Beck announces that he is now associated with Dr. J. H. Hester, in the practice of diseases of the Eye, Ear, Nose and Throat. Suite 849 Starks building, Louisville.

Dr. Samuel M. Baxter announces that after April 1st, 1929, he will be associated with Dr. Octavus Dulanev, 811-18 Brown building. Practice limited to Ophthalmology and Oto-Laryngology.

Kentucky Medical Journal

Published Monthly By
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Incorporated

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COUNTY SOCIETY REPORTS

Franklin: The Society met in regular monthly session Thursday, February 7th, 1929, in the writing room of the Capital Hotel. Members present were: Drs. E. C. Roemele, John Patterson, C. T. Coleman, E. C. Ycumans, A. M. Jackson, N. M. Garrett, R. B. Ginn, M. C. Darnell A. M. Lyon, F. M. Travis, G. A. Budd, R. M. Coblin, L. T. Minish.

The Society was called to order by the President, Dr. Patterson, reading of the minutes of the previous meeting were dispensed with by vote of the Society.

Mr. George H. Schmitter was present and showed to the Society a moving picture reel—"Movements of the Alimentary Tract in Experimental Animals." The motion picture prepared for Petrolager by Professors Anton J. Carlson and Arno B. Luckhart at the University of Chicago. This unusual picture was highly instructive and was much appreciated by the members who were present to see it.

Mr. Schmitter was heartily thanked for presenting the picture.

The Society then adjourned to the hotel dining room for lunch.

L. T. MINISH, Secretary.

Franklin: The Society met in regular monthly session March 7th, 1929. The meeting was held in the Auditorium of the Kentucky State Institution for the Feeble Minded, with Dr. A. M. Lyon the Superintendent of the Institution, as host and essayist.

Members present were: Drs. John Patterson, A. M. Lyon, C. E. Youmans, M. C. Darnell, R. B. Ginn, E. C. Roemele, R. M. Coblin, A. M. Jackson, G. A. Budd, C. T. Coleman, G. H. Heilman and L. T. Minish.

The President, Dr. Patterson, called the Society to order and after reading and approval of the minutes of the February meeting, the meeting was turned over to Dr. Lyon, who presented the Society with a paper on the subject: "Heredity in Mental Diseases," at the same time bringing before the Society, children of all ages representing all types of mental defectives.

The essayist held the members spell-bound and many times he was interrupted by questions concerning the subject he was presenting.

After Dr. Lyon had finished, Dr. E. C. Roemele offered a motion, which was duly seconded and unanimously carried, that the Secretary of the Kentucky State Medical Association be requested to have Dr. Lyon's paper published in the Kentucky Medical Journal and that copies of same be sent to each member of the next Legislature.

The Society then adjourned to Dr. Lyon's dining room, where an elaborate dinner had been prepared under the supervision of Mrs. Lyon, after spending some time at the festal board, Mrs.

Lyon was presented and a rising vote of thanks was extended her for the delightful part she had taken in the day's program.

L. T. MINISH, Secretary.

Jessamine: The Jessamine County Medical Society met at the home of Dr. T. R. Welch. After a delightful dutch lunch, served by the doctor's chef, in a very splendid manner, the meeting was called to order by the President, Dr. Welch, with nine members present. Dr. T. R. Welch was elected president and Dr. J. A. Van Arsdall, secretary and treasurer for the ensuing year.

Dr. T. G. Cook read a paper on "Some of the Dangers of Ephedrine Medication" and Dr. C. A. Neal reported a case and asked that members offer suggestions as to probable diagnosis, after a lengthy discussion of both papers, Dr. Neal concluded with report of post mortem findings in his case, which was malignancy at the Pylorus.

After the payment of dues, the Society adjourned to meet Thursday, April 18, at 7 p. m.

J. A. VAN ARSDALL, Secretary.

Scott: Scott County Medical Society was delightfully entertained by the retiring president, Dr. H. H. Roberts, at the Colonial Inn, with a five-course dinner and the following visitors and members present: Dr. William Mithoeffer, of Cincinnati; Dr. J. S. Daily, Dr. Pinnell, Dr. Sam Marks, Dr. Charlie Vance, Dr. J. A. Stucky, Dr. Julian Estell, Dr. Armstrong, Dr. Carl Wheeler, of Lexington; Dr. William Stout, Dr. Rudd Coffman, Dr. L. D. Bourne, of Georgetown; Dr. H. H. Roberts, Dr. H. V. Johnson, Dr. S. S. Amerson, Dr. William Mason, Dr. P. H. Crutchfield, Dr. D. B. Knox, Dr. J. W. Baird, Dr. C. T. Lancaster, Dr. E. A. Anderson, Dr. J. C. Thomasson, Dr. W. W. Allphin, Dr. L. F. Heath, and Dr. E. C. Barlow, members.

After partaking of this delicious dinner, we retired to the City School for the meeting. Minutes of previous meeting were dispensed with, the first business was that of election of officers for 1929, as follows: Dr. J. W. Baird, president; Dr. E. A. Anderson, vice president; Dr. A. Stewart, secretary; Dr. H. V. Johnson, delegate to State Medical Society; Dr. H. H. Roberts, alternate, and censors, Dr. H. V. Johnson, 1 year, Dr. William Mason, 2 years, Dr. C. T. Lancaster 3 years.

After which we enjoyed a most excellent and scientific lecture and demonstrative lantern slides by Dr. Mithoeffer on Nasal and Accessory Sinus and the General Practitioner. Discussion was opened by Dr. J. A. Stucky, of Lexington, Dr. Sam Marks, Dr. Julian Estell and Dr. H. V. Johnson, closed by Dr. Mithoeffer.

A vote of thanks and appreciation for Dr. H. H. Roberts, was made by the society for his efficient administration, as we have had the best year for our Medical Society in many years, also

for the delightful manner in which he entertained.

The public was invited and was well represented by influential citizens.

A. STEWART, Secretary.

Owen: The Owen County Medical Society met in regular session at Clark Hotel with Dr. A. E. Threlkeld, presiding.

The society was entertained with luncheon at Clark Hotel by Drs. Purdy and McBee. Five of our six members were present.

After luncheon, officers were elected for ensuing year and dues collected from all six members. At this time, a motion was made to adjourn until next call of the secretary.

K. S. McBEE, Secretary.

BOOK REVIEW

THE ELEMENTS OF THE SCIENCE OF NUTRITION. By Graham Lusk, Ph. D., Sc. D., Professor of Physiology at the Cornell University, Medical College, New York City. Fourth Edition, Reset. Octavo of 844 pages. Philadelphia and London: W. B. Saunders Company, 1928. Cloth \$7.00 net.

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KENTUCKY MEDICAL JOURNAL



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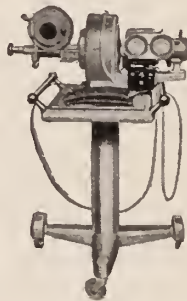
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BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

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BOWLING GREEN, KY., JUNE, 1929

No. 6

EDITORIAL

THE POST GRADUATE COURSE

The Post Graduate Course of instruction which we will have in Louisville from July 8th to 20th inclusive under the auspices of the State Medical Society is rapidly taking shape and we are anticipating a large attendance. The Louisville Tuberculosis Association has repeated its invitation to us to have luncheon and a series of demonstrations of all forms of tuberculosis. This was an outstanding event during last year's course. The Children's Hospital will have open house with a luncheon such as was enjoyed before.

Although the Course is held under the auspices of the State Medical Association an invitation is extended to all the old graduates of the University and to all the doctors of the adjoining States to be with us at that time and partake of our hospitality. A very pleasant feature of the Course has been the meeting up with classmates. The Louisville Baseball Club will be here most of the time so that on Saturday afternoon there will be an opportunity to see professional ball.

Begin to make plans to come to Louisville at this time as it will be a valuable review of new methods of diagnosis and treatment with plenty of variety so that the visiting doctors will be entertained as well as benefited.

SCARLET FEVER

The editor has been having a most interesting experience in the study of scarlet fever during the recent extensive epidemic at Berea College. As unfortunate as it was for the individuals affected, no other place could have been found where so complete a study of the disease could have been made. The fine co-operation of President Hutchins and members of the faculty, of Doctors Cowley, Armstrong and Payne of the medical staff and of probably the most co-operative student body in Kentucky, made it possible to obtain multiple nose and throat cultures, to Dick test every individual in the institution at least twice and sometimes oftener and to immunize every single individual found susceptible by the administration of the five doses of the prophylactic toxin. The whole study was made by the State Board of Health and the local physicians, who felt themselves extreme-

ly fortunate in having the advice and fine leadership of Dr. Gladys Dick, co-discoverer with her husband of the modern knowledge and methods for the prevention and the treatment of this heretofore baffling disease.

Scarlet fever is caused by one of the family of hemolytic streptococci. It cannot be differentiated from others of this group by morphological or cultural methods. The only differentiation is by making broth cultures and from the type which causes scarlet fever, the scarlet fever toxin is isolated. The details of the experience will be published later and will demonstrate conclusively that this disease is now entirely preventable and controllable. It is enough, at this time, to say that 90% of the cases showed no scarlet rash and some of the most seriously sick individuals were those who had only the septic sore throat.

While many of the cases cleared up very rapidly following the administration of the scarlet fever antitoxin, others, and this includes especially those with diseased tonsils and adenoids, remained carriers for weeks, and where the sinus or mastoid became infected, they frequently remained carriers for a much longer period of time. This indicates that our American custom of a twenty-eight day quarantine is inadequate. The thirteen week quarantine of the British is evidently the reason for their much lower incidence of this disease, as probably 98% of the cases are cleared up in that time. However, as in the case of diphtheria, it will be possible, by making cultures at intervals of forty-eight hours two or three times, to release cases from quarantine earlier as they clear up.

It is important that the profession realize the necessity for scarlet fever immunization. It was demonstrated at Berea that immunization by the Dick method is effective. It is important to understand that following one of the five doses of the immunizing toxin, there is generally a considerable reaction. Some of the patients vomited; a few had rather a severe headache; but the important thing is that none of them was seriously sick. In this way alone can they avoid the danger of the complications and infections that so frequently follow even milder attacks of the disease. A majority of the patients who had simple sore throats showed either albumen in the urine or some other definite sign of infec-

tious hang-over from their attack. On the other hand, not one of the several hundred people who were immunized had any of these conditions.

It is equally interesting that the desquamating skin is not infectious and that the rash, although it is lighter and more ephemeral, occurs practically as frequently during immunization as during the attacks of the disease. The infectious germs come from the nose and throat.

We were fortunate in being invited to make a similar study at the Eastern Normal School at Richmond by President Donovan and Doctor Ferris, the school physician. They had had no scarlet fever and the statistical report showed that the check up was perfect. All of the susceptible at this institution and at the high school at Richmond and several rural schools in Madison county were also immunized.

The profession is warned against the use of other methods of immunization than those devised by the Doctors Dick. They produce more severe re-actions because they are unstable and unstandardized and immunity produced by them is temporary instead of permanent. The material supplied by the State Board of Health and through its depots in the various counties is standardized and reliable.

We ask our readers to await the tabulation of the details of this study which we know they will read with interest and profit. It is of interest that the Doctors Dick have made clear the unknown factors which have heretofore baffled us in the mangement of this disease. It will be an open book to those physicians who study this report.

A STATEMENT AND AN OPPORTUNITY

Every physician in Kentucky has been thrilled by the history of its medical pioneers. The remarkable vision of these men pictures for us most of the principles underlying the advancing modern medical practice. It is interesting to read again and again the peroration of Doctor Gross' address at the unveiling of the McDowell monument at Danville in 1879 and then to read the history of the slow but sure development of the great work this seer then helped to inspire. You will recall that Doctor Gross said:

"Young men of the Kentucky State Medical Society, listen to the voice of one who has grown old in his profession and who will probably never address you again, as he utters a parting word of advice. The great question of the day is, not this operation or that, not ovariectomy or lithotomy, or a hip joint amputation, which have reflected so much glory on Kentucky medicine, but is preventive medicine, the hygiene of our persons, our dwellings, our streets; in a word our surroundings, whatever and wherever they may be, whether

in city, town, hamlet or country, and the establishment of efficient town and state boards of health, through whose agency we shall be the better able to prevent the origin and fatal effects of what are known as zymotic diseases, which carry so much woe and sorrow into our families and which often sweep, like a hurricane, over the earth, destroying millions of human lives in an incredibly short time. The day has arrived when the people must be roused to a deeper and more earnest sense of the people's welfare, and when suitable measures must be adopted for their protection as well as for the better development of their physical, moral and intellectual powers. This is the great problem of the day, the question which you, as representatives of the rising generation of physicians, should urge, in season and out of season, on the attention of your fellow-citizens; the question which above all, and beyond all others, should engage your most serious thoughts and elicit your most earnest co-operation. When this great, this mighty object shall be attained; when man shall be able to prevent disease and to reach with little or no suffering his three-score years and ten, so graphically described by the Psalmist, then, but not till then, will the world be a paradise, with God, Almighty, All-wise, and All-merciful, in its midst, reflecting the glory of His majesty and power, and holding sweet converse in a thousand tongues with the human family."

Just as McDowell, Brown, Dudley and the other pioneers handed down the torch of medical knowledge and medical responsibility to their successors, just so Gross and Jackson and Wathen, the elder McCormack, McMurtry and Matthews pass on their mantle to us.

Among them was one man who still lives and still breathes the same inspired thoughts that lead us on. This man is Dr. J. A. Stucky, of Lexington, a skilled physician, among the foremost in the profession in his own specialty. He has been indefatigable in his labors for the upbuilding of the best interests of the profession and for the public welfare. It was his recognition of its nature and his vision of the possibilities of its eradication that enabled the State Board of Health and the State Medical Association to bring Dr. John McMullen to Kentucky and start the now well nigh accomplished task of the relief of the then 60,000 sufferers from trachoma. This is but one of the many instances of the valuable services of this good and great man.

Recently, before the Tennessee State Medical Association, he has delivered another address which promises to be epochal. It was on "The Responsibility of Ophthalmologists and Otolaryngologists for the Conservation of Public Health." For its opening paragraphs, there are plain statements of facts:

"Medical science has grown and of neces-

sity has been rewritten in the past twenty-five years. To my knowledge this is not true of any other profession. The early men were ambassadors to the sick, whereas in the present day we are more the apostles of prevention of disease.

"There is no career so high in its ideals, and few professions that require such preliminary training as does the medical profession. The specialty of ophthalmology and otolaryngology is not an adjunct or appendix of the medical profession but a real and most important part of it."

He then clearly sets forth many of the problems which the clinical practitioners in these specialties have been recognizing and treating these many years and then says: "Two questions might be asked: first, how much sickness and disease is preventable or avoidable; second, is sickness something which comes to us, a condition engendered within us or a physical and mental state which obtains within us, for which we are ourselves responsible? It seems we have been rather stupid in allowing people to wait until they are actually sick and in many cases irreparable damage done instead of taking measures to prevent the condition."

In conclusion, Dr. Stucky summarizes the subject as follows:

"My desire has been to present this topic for thoughtful consideration in a brief epigrammatic way from the viewpoint of: (a) unsolved problems of ophthalmology and otolaryngology, (b) suggestions for more careful clinical study of individual cases, (c) consideration of our system of medical education—is it the most effective and practical for the practice of the science and art of medicine, (d) appreciation of our responsibility for the conservation of public health.

"The unknown etiology of diseases confronting the ophthalmologist and otolaryngologist is a challenge to us, until their causes and prevention are known.

"The increasingly large number in attendance at our public health clinics, the great financial cost of equipment and maintenance of these clinics, with the impaired or destroyed efficiency of those treated, and the time and labor given by the ophthalmologists and otolaryngologists, intensifies the challenge and magnifies our responsibility for the conservation of public health.

"Shall we make of the specialty of ophthalmology and otolaryngology a real health service, by learning the cause and prevention of the diseases we now treat, or shall we continue to be content to treat defects and end results by mechanical and local methods rather than in accordance with our newer knowledge which makes of us really scientific practitioners?"

Doctor Stucky's splendid address is commended to the thoughtful consideration of all our readers. It will give real food for

thought, not only to his associates in his own specialty but to every man who is practicing medicine."

THE AMERICAN HEART ASSOCIATION

As long ago as 1911 the problem of heart disease and the heart patient began to attract attention. At this time Bellevue Hospital, in New York established a special out-patient heart clinic. Interest in cardiac problems grew steadily and in 1915 the "New York Association for the Prevention and Relief of Heart Disease" was incorporated.

The work begun by the New York Association grew and not only were local physicians interested in the organization, but cardiologists of other cities were members. Similar Associations were later established in Philadelphia, Chicago, Boston and elsewhere. As this nation-wide interest became more manifest a group of cardiologists met in St. Louis in 1922 for the purpose of considering the advisability of forming a national organization. It was unanimously agreed that an organization of national scope was required. After careful preliminary surveys were made the American Heart Association was formed in 1924 with a central office at 370 Seventh Avenue, New York City.

The objects and purposes of the American Heart Association are as follows: "The study of and the dissemination and application of knowledge concerning the causes, treatment and prevention of heart disease; the gathering of information on heart disease; the development and application of measures that will prevent heart disease; seeking and provision of occupations suitable for heart disease patients; the promotion of the establishment of special dispensary classes for heart disease patients; the extension of opportunities for adequate care of cardiac convalescents; the promotion of permanent institutional care for such cardiac patients as are hopelessly incapacitated for self support, and the encouragement and establishment of local associations with similar objects throughout the United States." Widespread interest has been manifested, not only by physicians but also by laymen, in the problems upon which the American Heart Association is working.

The organization issues many leaflets, publishes a Bulletin and supervises the publication of the American Heart Journal. During 1928 more than 100,000 leaflets and pamphlets on heart diseases were distributed. With cardiac disease definitely on the increase, with deaths from heart disease mounting from 169 in 1916 to 199 per 100,000 in 1927 the opportunities before the American Heart Association are vast. The activities of the Association are expanding rapidly and it is measuring up to its responsibilities.

ORIGINAL ARTICLES

HEADACHE*

By E. E. SMITH, M. D., Bardwell.

I have been wondering why the program committee selected this topic for me to discuss, in as much as there are members of the Society that have had much more practical experience with headaches than I have. Perhaps they too will wonder why they gave me this subject before the paper is concluded. Though, with your indulgence, I shall try to discuss the subject in as practical a way as possible, leaving the ultra-scientific out as much as I can.

Headache (Cephalalgia) is defined as being a diffuse pain, which may be paroxysmal or continuous, affecting different parts of the head, and not confined to course of any particular nerve. The etiology of headaches are many, and may be conveniently divided for study into the following divisions.

(1) Reflex Irritation. (2) Toxemic (3) Circulatory disturbances. (4) Neuroses. (5) Organic Diseases of the Brain, and (6) Indurative.

In reflex irritation we have ocular symptoms, which may be eye-strain or inflammatory disturbances; nasal pharyngeal; diseases of the accessory sinuses; auditory; decayed teeth; reproductive organs, especially in the female; and thoracic and abdominal viscera.

Under toxemia we have infections, as acute infectious diseases, malaria and syphilis before the secondary symptoms appear, intestinal toxemias as kidney and liver insufficiency. Thyroid disturbances and drugs.

Under circulatory disturbances we have (a) Passive congestion as by posture; tight clothing about the neck; pressure on veins by tumors; diseases of the right side of the heart emphysema and other conditions of the lungs which prevent the free circulation of the blood. (b) Active hyperemia from excessive physical and mental strain, and early stages of acute meningitis. (c) Anemia following loss of blood or the idiopathic anemias, especially chlorosis; diseases of the heart which prevent the blood from reaching the brain, as aortic stenosis and fatty degeneration.

Under neurosis as causes of headache are epilepsy, hysteria or neurasthenia.

In organic diseases of the brain we find as causes, meningitis, syphilitic, traumatic or otherwise; encephalitis; abscess; tumor and aneurysm.

Under indurative or muscular, which is due according to Edinger, to the presence of nodules in the muscles of the scalp and neck

Muller believes they are due to an increased tension and shortening of the muscles and calls them muscular headaches. The most common of the causes are eye-strain, gastro-hepatic derangements, constipation, alcohol, uterine disorders, anemia, neurasthenia, indurative and febrile affections. It has been suggested that flat-foot might be a predisposing cause. Several of these causes may co-exist.

Pathology. Of the exact mechanism of headache we know nothing. The brain substance itself is apparently insensitive to direct irritation but processes which irritate sensory nerves in any part of their course may be referred to the cortical centers of these nerves and appreciated as pain. The dura is sensitive to direct irritation, and most headaches of organic origin are due to irritation of this membrane. While the pain in the majority of headaches appears deep seated in some cases it is referred to the scalp, and these are usually associated with tenderness on pressure and are usually due to rheumatism or syphilis.

A review of the nerve supply of the dura and scalp might explain the origin of some headaches. The supply of the falx, tentorium and anterior three-fourths of the dura is derived from the fifth nerve; the posterior fourth from the sensory fibers of the vagus. The scalp as far back as the vertex is also supplied by the fifth, the remainder deriving its supply from the posterior branches of the upper four cervical nerves. The sensory (descending) root of the fifth nerve is in close relation with the origin of the cervical branches in the cord and of the cervical in the medulla; the region supplied respectively by the fifth and vagus overlap; the vagus furnishes part of the nerve supply to the viscera. In addition the Pia (according to Gray) is supplied by branches from the 3rd, 5th, 6th, 7th, 9th, 10th and 11th cranial nerves, the posterior branch of the first cervical and sympathetic. These relations readily account for the fact that headache is so commonly caused by irritative conditions in other organs. Headache is also produced by anything that causes increased blood pressure, and all headaches except those due to impoverishment of the blood are made worse by sudden lowering of the head.

SYMPTOMS: The pain in headache often differs in character and location according to the cause. These facts while not absolute, may be of service in diagnosis. It may be pulsating or throbbing; dull and heavy; constricting or pressing; hot burning or sore boring or sharp in character. In location it may be frontal, occipital, parietal, temporal, vertical, diffused or combinations of them.

*Read before Carlisle County Medical Society at Arlington, March 5, 1929

A pulsating or throbbing pain, situated either in the vertex or diffused, is characteristic of that due to circulatory disturbances. The dull heavy pain, often frontal, is frequently found in toxic headaches. The constricting or sense of pressure type is common to neurasthenia. Patients often describe this as a tight band being drawn about the head. Headaches of a neurasthenic type may be present in children owing to overwork at school. The hot burning pain, usually vertical, is common in headaches due to anemia. The sharp boring variety, is found in hysterical and neurotic, it is often described as if a nail were being driven into the head; this type is called *clavus hystericus*.

Headache caused by hypermetropia, astigmatism, or lack of muscle balance, is aggravated by using the eyes, and is associated with other symptoms of asthenopia; is better in morning and situated either just over the orbits, in the occiput or both. Headaches are also caused by deep inflammatory conditions as iritis, ulcer and glaucoma. The pain in the latter is usually temporal. Diseases of the throat and accessory sinuses are common causes, and these parts should be investigated in all chronic headaches. The pain in these conditions is frontal, often extending to the occiput and comes on an hour or two after rising, disappearing toward evening and is aggravated by lowering or jarring the head in any way. The syphilitic or organic headache is apt to be markedly aggravated at night, being so severe as to prevent sleep; functional headaches rarely do this.

Indurative headaches are exceedingly common and Edinger believes they are more so than those due to any other cause. They are usually due to exposure, to cold winds, washing the hair or the rheumatic or gouty diathesis. The character of pain closely resembles that of migraine. Examination shows areas of tenderness with swelling and induration where the muscles of the neck are inserted to the skull. This tenderness can also be found between attacks of pain, and examination of these parts should always be made in any case of headache.

Symptoms which may accompany headache, are vertigo, nausea and somnolence. In examining a case of chronic headache all of the causes thus detailed must be borne in mind, and careful inquiry made as to the condition of the eyes; nose; throat; teeth, pelvic organs, if a woman, heart, blood vessels, blood, digestive organs, habits as regards alcohol, tobacco, etc., and the possible existence of neurasthenia, hysteria, and organic diseases of the brain or membranes.

DIAGNOSIS: Headache must be distinguish-

ed from migraine, of which headache is a symptom, and neuralgia. The pain of headache is usually bilateral, and is more or less persistent; that of migraine is paroxysmal and unilateral and is associated with other sensory disturbances; it passes off leaving the patient feeling better than before, to return at more or less regular intervals. The pain of neuralgia is shooting and limited to the course of some nerve along which there are often tender points.

Having determined that headache is the condition present, we ascertain to which of the causes mentioned in the discussion, it is due, we begin our treatment accordingly.

The treatment of headaches is varied and as a rule resolves itself to the treatment of the underlying cause. Patients with headaches are prone to become early victims of various nostrums, which are varied if not more so than the cause of the symptoms. Practically all of them contain drugs of great toxicity, or else consist of worthless mixtures with no appreciable effect. Recently acetylsalicylic acid has become the mainstay of the large group of the laity, who purchase headache cures in preference to consulting a physician.

In all cases of headache treatment should first consist of a sufficiency of out-door exercise; second, a simple varied well balanced diet; and third, there must be a free daily movement of the bowels. Of those headaches due to ocular and reflex conditions, Osborne believes there is nothing more helpful than acetanilid. The dose should be small and it is well to combine the drug with soda-bicarb. while caffeine adds to the toxicity of the coal-tar product, it has a useful action in the relief of those due to eye-strain. If much of a dose of a coal-tar product is given, the patient should lie down for several hours, if possible. Otherwise, the cardiac depression caused by the eye reflex plus the depression caused by the coal-tar drug will produce faintness and more or less temporary debility.

While phenacetin perhaps is a safer drug to use, the dose is much larger and the depression about the same. Some find cold to the head of an advantage, while in some it causes nausea. Others find hot applications satisfactory. Sometimes a hot foot bath will change the circulation sufficiently to relieve the head congestion.

I have not attempted to discuss the treatment of headaches in an exhaustive way as was stated in the beginning, it is a matter of cause and as such, the treatment must be directed accordingly.

ADENOCARCINOMA OF CECUM, CONGENITAL HYPERTROPHIC PYLORIC STENOSIS*

By J. GARLAND SHERRILL, A. M., M. D., F. A. C. S., Louisville.

The first case to be narrated impressed some important facts upon my mind. Recently I was called to operate upon a man aged 52, in another city, for appendicitis. Upon examination it was found that the patient gave a very imperfect history, in fact little information could be obtained from him, and his physician seemed to know little about him.

The man stated that a year ago he made a visit East and had been sick ever since he returned, that he had a "cold" and also an attack of influenza followed by some rather indefinite symptoms, and finally he developed pain in his abdomen first at one place then another, also that he had suffered from "stomach trouble" for a number of years, that he had distension of the stomach after eating with gaseous eructations, and was very nervous.

Within the last few weeks he had lost some flesh and recently complained of sharp pain particularly in the right quadrant of the abdomen. His wife was asked to tell me more exactly what the symptoms had been, but no further information was obtained. I examined the chart and finally discovered that the patient's father died at 56 of gastric carcinoma; family history otherwise unimportant.

On physical examination, the abdomen was not rigid and not particular tender. There was some resistance over the gall bladder region and around the cecum. The attending physician said the leucocyte count was 9,800. The chart at the hospital showed leucocytes 7,600 with only 45 per cent polymorphonuclears; hemoglobin 75 per cent. The conclusion was inevitable that the man did not have appendicitis.

A general anesthetic was administered and I felt a small mass in the right side of the abdominal cavity which might be the appendix, but was suspicious of a malignant growth involving the cecum. When the incision was made, the appendix was found to overlie the colon and did not appear to be inflamed, but within the intestine was found a tumor mass which protruded into the lumen, and there were several enlarged glands in the mesentery. By incising the outer parietal peritoneum the large intestine was properly exposed, and resection made of the ascending colon, cecum, appendix and a part of the ad-

jacent ileum. An end-to-side anastomosis was then made after closing the lumen of the cecum. Pathological examination shows that the growth is an adenocarcinoma of the cecum.

Information obtained from the family afterward and from the attending physician, was that the patient had passed some blood from the rectum. I did not know of this until after the operation. The man had passed a stool of pure blood about three weeks before, followed by some black blood, which the physician had attributed to "piles." The man also stated to the physician at that time that he did not feel as though he emptied his rectum during defecation as thoroughly as he should.

The point I wish to make in reporting this case is that the surgeon is often called to another city to operate and finds that upon an insufficient study of the patient a diagnosis has been made, and if operation is undertaken under such circumstances, a serious mistake might be easily made. This patient had been under the observation of a prominent gastroenterologist, who had made the diagnosis of gastric disease. Two roentgenograms had been made with the report that no distinct or clear shadow was noted in the region of the cecum.

The second patient, a child five weeks old, was brought to my office by a physician from the country. Weight of the child at birth, 10½ pounds, present weight, 6 3-10 pounds. The baby nursed at the breast for a week until the mother became ill and thereafter, was fed on artificial food. There was very little loss of flesh before he began taking artificial food. Since that time, or about twelve days ago, he began to vomit food and water. He vomits after each feeding, usually after half an ounce is taken. The vomited material consists chiefly of food products unchanged. Several doses of castor oil had been administered and retained with but little result. After enema a small amount of feces passed. After vomiting, the child becomes easier and sleeps for a time. There has been no gaseous distension of the abdomen at any time.

Physical examination shows a poorly nourished child, some emaciation, skin is loose and dry and appears in folds. The child looks like an old man. He is evidently not getting sufficient water, as there is evidence of dehydration. His mentality is clear, special senses normal, chest negative but rather prominent breast for a baby. Pulmonary and cardiac sounds normal. No marked peristalsis, slight resistance in pyloric region. Rectal examination negative.

With the foregoing findings the diagnosis was made of congenital hypertrophic pyloric stenosis. Atropine had been administered for ten days by the attending physician.

*Read before the Louisville Medico-Chirurgical Society.

The child was operated upon by the Rammstedt method under local anesthesia with satisfactory recovery.

DISCUSSION

L. Wallace Frank: Speaking of the last case first, I would like to ask Dr. Sherrill how he kept the baby quiet during his operation under local anesthesia.

We have operated upon several patients of this type, and believe the secrets of success in the operative procedure are: (1) early diagnosis and prompt surgical treatment, (2) filling the blood vessels with saline solution. Operation should be performed as soon as the diagnosis can be made. Due to vomiting the child becomes not only acidotic from loss of food, but also dehydrated. The result will depend absolutely upon the degree of starvation of the child and the amount of dehydration. The greater the starvation, the greater the loss of weight, the more likelihood of an unfavorable result, and possible fatality. Such cases can be brought to a better state for operation by either transfusion of blood, or if this is not possible, by the introduction of glucose or normal saline solution subcutaneously.

Referring to the second case narrated. The specimen is most interesting. As we know, carcinoma of the large intestine is a very slow-growing process. Probably between 30 and 35 per cent of these individuals come to operation not because it is known they have carcinoma, but on account of intestinal obstruction, and that is especially true in malignant disease of the rectum and sigmoid. Such cases are seldom recognized in the early stages of the disease. Metastasis from carcinoma of the cecum does not occur early, and with wide excision and removal of all gland-bearing areas, the prospects for permanent cure are good.

Louis Frank: The first case reported by Dr. Sherrill is somewhat similar to two cases we reported some time ago before this society, and I want to repeat what I said then that this is no "school-boy" surgery. I also again call attention to the fact that the surgeon should be prepared to do whatever may be necessary after the abdomen is opened. The case reported illustrates that point very clearly, and it also emphasizes a feature—which cannot be done too often—that is the difference between OPERATORS and SURGEONS. There are men who are operators in every community in this and every other state, who urge the extirpation of ovaries, appendices, etc., because they have hospital facilities and nurses and rubber gloves and other operative paraphernalia necessary for doing the work. If any of these men were to encounter a case such as that described by Dr. Sherrill, they would abandon it as inoperable and close the patient's abdomen. This emphasizes clearly the difference between real surgeons and operators.

The specimen is of great interest, and as has been stated quite often, we do not see these patients until it is too late to accomplish anything by surgery. We also know there are many patients with carcinoma of the large intestine who, even when obstruction has ensued, have the abdomen opened, the obstruction is found, a colostomy is performed but nothing further is done, and the patient thereafter, leads a most miserable existence. Even in those cases where colostomy is necessary, opening the abdomen is a distinct aid in the future management of the case, as it enables the surgeon to determine the extent of metastasis if such has occurred. Any case where there is no metastasis in the liver, not too extensive metastasis in the mesentery and no implants in the pelvis, should be considered as operable, and at a later period an attempt should be made to excise the growth where obstruction exists in the colon sufficiently far away to permit of secondary operation and provided the conditions as mentioned, are not present.

We know that often in certain forms of carcinoma, not adeno-carcinoma but the scirrhus type which begins in the deeper structures, when patients apply for examination and treatment there is present an annular stricture. There may be little or no glandular involvement, and yet we know many of them are simply colostomized and abandoned to their fate, whereas if colostomy be performed far enough away from site of the growth its successful removal may be accomplished at a later date and the patient live his allotted time without further trouble so far as the carcinoma is concerned.

Carcinoma of the large intestine is slow to metastasize, and patients of this class exist for a long time with symptoms which are attributed to hemorrhoids or some other intestinal lesion before coming to operation. As has been said, the majority of them apply for relief of intestinal obstruction.

In all cases of the type being discussed, the roentgenogram should be carefully studied. In my opinion wherever there is the least filling defect the case should be regarded as malignant until it can be demonstrated otherwise.

J. Garland Sherrill, (in closing): I thank the gentlemen for their discussion. The point made by Dr. Louis Frank cannot be too frequently emphasized, that any man who undertakes abdominal surgery should be prepared to cope with any emergency that may arise in connection with the operation, because it makes no difference how superior may be our judgment we frequently make mistakes in diagnosis finding conditions present of which we had no conception prior to operation. It is all very well to open the abdomen and remove a simple diseased appendix, a great many men can do that satisfactorily if they are fairly well trained in surgery as no special skill is required.

Most of the patients with carcinoma of the colon come to us with acute obstruction proximal to the growth as was present in the case reported. Under these circumstances the danger to the patient, outside the immediate danger of contamination at operation and from hemorrhage consists in absorption of material in the intestine above. That in this type of obstruction the intestine produces virulent poison has been shown by Whittle, Stone, Bernheim and others. This is destructive to function and distressing to the patient. In a few such cases I have sometimes proceeded with resection when it should not have been done. One's judgment in handling these difficult cases improves with experience. The first procedure should be to relieve the tension above and get rid of the fluid which has accumulated either by draining the intestine or by a combination of drain in the intestine and gastric lavage, allowing conditions to right themselves somewhat before making final excision of the growth. After the intestinal tract has been emptied and made clean, resection can be performed without any more trouble than might occur in other conditions.

Regarding the second case; I agree with Dr. L. W. Frank that whether a patient with congenital pyloric stenosis gets well or dies, depends on the early time at which the condition is recognized. These little patients wither away very rapidly from lack of nourishment and particularly water and soon look like old people. In this case the diagnosis was made rather promptly, ten days after the child ceased to nourish and began to vomit. There was no excessive peristalsis, no ballooning of the intestine, no obstruction of the rectum, and all symptoms pointed to pyloric stenosis, so we had from the beginning almost a positive diagnosis. Moreover the child had been given belladonna for ten days by the attending physician. Roentgen-ray examination is a most valuable aid in the diagnosis of this condition.

Children of this type show very little resistance to local anesthesia. The Rammstedt operation is a simple procedure, the abdomen is merely opened, the pylorus elevated and incised to the mucosa and replaced. The results obtained by Downes and others are remarkable in this particular field, and are confirmed by our own findings.

The suggestion was made that this child be given an abundance of water for three days prior to operation, but I concluded the best thing to do was to give him water by proctoclysis, water by the mouth if retained, adding glucose to water given per rectum. Water is the "saving grace" for these children and should be followed by prompt surgical treatment. Rarely transfusion may be necessary. It was formerly the practice to perform gastroenterostomy in these cases, but the mortality from that operation was considerably higher than from the procedure proposed by Rammstedt.

SARCOMA OF THE JAW IN CHILD AGED TWO AND ONE-HALF YEARS*

By L. WALLACE FRANK, A. B., M. D., F. A. C. S., Louisville.

I desire to record the following case, first because it is somewhat unusual, second the question whether or not the lesion was metastatic.

A female child, aged two and a half years, was admitted to the Children's Free Hospital in June, 1926, with the history that some time in the first year of life her left eye had been enucleated for what was said to be sarcoma. There was no further trouble until about a month and a half before she entered the hospital, at which time she had a large swelling of the right mandible. The tumor mass was in about the position of the second molar tooth, and viewed from the mouth it was at first thought to be suppurative in character. There were no enlarged glands about the jaw or neck. The tumor was somewhat tender and from its gross appearance was presumed to be malignant. However, the roentgenologist pronounced it a bone cyst. The involved area was curetted and all necrotic material removed. The curettment was thoroughly done and there was considerable bleeding. The debris removed was submitted to the laboratory and after examination was pronounced chronic inflammatory tissue. The packing was removed on the third day. The opening in the jaw healed and the child went home. There was still present some swelling at the site of the cyst.

About three months later the child returned to the hospital complaining of severe pain in the jaw and swelling had recurred. While we still had in mind the diagnosis of inflammatory bone cyst, we decided to remove the growth from the outside. Inside the mouth the tissues had healed. The size of the growth was about the same as before the first operation. An incision was made below the angle of the jaw and the tissues of the face were raised above the mandible. One enlarged lymph gland was found which was excised. We chiseled away the outer wall of the mandible and curetted it thoroughly and packed the wound with gauze.

The child later developed an infectious disease and was in the city hospital for a time, but made a satisfactory recovery. The packing was removed within four days.

The enlarged gland that was removed was sent to a well known laboratory for examination and was reported as a "small cell sarcoma." I am informed that the child died from recurrence of the sarcoma, approximately nine months from the date first seen. The growth was very painful and large doses of

*Read before the Louisville Medico-Chirurgical Society.

morphine were required every two hours. The child gradually became worse and died of inanition apparently. She had some cough toward the last but no expectoration of blood.

The interesting feature about the case, the question as to whether or not this tumor of the mandible was secondary to the sarcoma of the eye or whether it was an independent new growth.

DISCUSSION

Adolph O. Pfingst: It does not seem to me plausible that this is a metastatic growth originating from the eye. In the first place I question whether the eye tumor was a sarcoma, because children of that age seldom have sarcoma of the eye. They have glioma which causes death by rapid progress locally but no metastasis.

Stuart Graves: Tumors occurring in the eye are basal cell tumors, gliomas and nerve cell tumors, and again are mesoblastic in origin. The spindle cell tumors are practically all sarcomata. If this were a pigment cell tumor it would be very rare in a child. These tumors are disseminated by the blood stream. If it were a basal cell tumor it would probably have remained localized, because so far as I have ever heard any tumor arising in the central nervous system never metastasizes. The only exception I know to that statement is that there occurs sometimes a basal cell tumor at the lower extremity of the embryonic spinal column—the coccyx—which metastasizes. Therefore, there could hardly be any connection between the original tumor of the eye and the condition in the jaw or in the lymph gland. If it were a tumor of the bone or periosteum, it would be most surely malignant, probably a periosteal spindle cell sarcoma although the cells might have been small. The cyst, however, would point more to one of the slowly growing tumors of the jaw sometimes called giant cell sarcomata, but they are sometimes neoplasms and sometimes not. Lymphosarcoma seems to be excluded. It is impossible to tell what the cells were from the description given.

J. Garland Sherrill: There is much yet to be learned about the question of sarcoma. I would like to ask Dr. Pfingst the youngest patient he has seen with sarcoma of the eye? The youngest child I ever saw with sarcoma was three months old. The tumor was located on the back of the neck and was successfully removed at three months of age. The patient is now twenty, a young lady, and well. In sarcoma we get more recoveries than is generally believed. Of course Dr. Pfingst has had more experience with the eye than I, and is more familiar with the literature, but my impression is that sarcomata of the eye are very prone to recur promptly with metastasis through the blood stream. Upon investigating the question of sarcoma a few years ago it was found that this tumor located in the abdomen was more prone to recur in the glandular struc-

tures than even carcinoma. Melanotic tumors are exceedingly malignant and are likely to show metastasis. The gland in the neck in Dr. Frank's case was metastatic from the growth in the jaw, but it is quite probable that the child really had sarcoma of the eye with recurrence in the jaw. Sarcoma in any part of the body may be transplanted in any of the bones. There is a growth we do not see often, that is hypernephroma of the kidney. This tumor may recur in almost any part of the body. A cyst of the bone examined under the microscope could be taken for sarcoma because of similarity of appearance. Cases of this kind should be carefully checked, and I would suggest that Dr. Frank see just what the report was on the tumor of the eye. I have made a considerable study of tumors and am fairly familiar with their clinical and pathological aspects. Clinically sarcoma is always locally malignant. Sometimes it is not constitutionally malignant. The myeloid types involving the lower jaw may respond to excision or roentgenotherapy and perhaps not prove as malignant as some of the other growths. One of my patients had a primary removal of sarcoma of the lower jaw. All the growth was removed so far as we could determine, with the capsule, and yet it recurred. A second operation was performed extirpating the lower jaw with final recovery.

James Royden Peabody: While associated with the late Dr. A. M. Cartledge, in 1907, I assisted him in operating upon a child less than one year old for sarcoma of the kidney. The case was reported before the Louisville Surgical Society and I was asked to be present. The diagnosis of sarcoma of the kidney was made by the late Dr. John Hays. Investigation of the literature at that time showed very few reports where the patients survived. Some died at the time of operation, others a short time afterward. Record was found of only one child who lived as long as six years. The patient to whom I have especially referred is still living and is now twenty-one years old. It may be interesting to note that the father of this young man asked me not long ago to write the surgeon general and explain that I was present when his son was operated upon, etc. It seems the boy was rejected at Annapolis because he had only one kidney. It is of further interest that this boy, two or three years after the operation, had scarlet fever and various other infectious diseases but survived them all and is still living. My investigation at the time, showed one patient living after six years, all others having died from metastasis.

L. Wallace Frank, (in closing): I thank the gentlemen for their discussion and suggestions. I shall be glad to investigate the report on the eye which was removed and ascertain definitely whether or not the tumor was a sarcoma. The mother was positive it was a sarcoma, and she had been warned about the possibility of recur-

rence and told to watch for it. After I had examined the child primarily the mother asked me if the tumor involving the jaw was sarcoma. Viewed from the mouth it looked like a malignant tumor.

Some one spoke of the fact that we should not confound malignant tissue with inflammatory tissue. I think it happens relatively frequently that we get laboratory reports reading chronic inflammatory tissue changes, when in reality the lesion is malignant. In the small sections examined it is not an unusual mistake to diagnose the tissue as inflammatory when it is malignant. In the case reported the first specimen was classified as bone cyst, the second as inflammatory tissue, and the lymph gland was reported simply as a small cell sarcoma without specifying whether the cells were round or spindle.

CONGENITAL OBLITERATION OF THE GALL BLADDER WITH ATRESIA OF THE EXTRA-HEPATIC BILE DUCTS AND AMPULLA OF VATER*

By T. COOK SMITH, M. D., AND ROBERT T. BALL, M. D., Louisville.

About one hundred and twenty cases of congenital obliteration of the bile ducts are reported in the literature. (1) This case is added because of the rarely associated atresia of the Ampulla of Vater. Fifteen cases are reported in which the gall bladder is absent. (2) The present case report brings the total to sixteen. It is the only case of congenital obliteration of the bile ducts found in two thousand three hundred and nineteen consecutive autopsies held at the Louisville City Hospital.

The patient was a female negro infant, who lived sixteen days after a normal delivery and died following continuous hemorrhage from the umbilicus. The gross anatomical findings were congenital absence of the gall bladder with atresia of the extra hepatic bile ducts and Ampulla of Vater. Microscopical sections showed bile capillaries in the position of the common and hepatic ducts. A diffuse inflammatory reaction was present in the region of the ducts and throughout the liver.

CASE REPORT

A. A., age 16 days; born April 12th, 1925, was admitted to the colored children's ward of the Louisville City Hospital on April 29th, 1925. Mother's complaint: "Baby bleeding from the naval." The patient had been seen by someone previously who took several horse-hair sutures through the skin about the um-

bilical stump, drawing it tight in a fruitless effort to stop the hemorrhage. When seen by us the baby had just died and it then presented the following physical findings:

A colored female infant in the new born period, showing recent loss of weight. Skin that of a muatto type; rather markedly jaundiced. The eyes showed very jaundiced sclerae. The lips and mucous membranes were very pale. The body was quite warm. The feet and hands were cold. On palpating the abdomen a stool was expressed which was almost pure white in color and with a consistency of tooth paste. No palpable enlargement of liver. The white stool, together with the marked jaundice, recurrent hemorrhages and otherwise negative physical findings suggested a diagnosis compatible with Congenital Atresia of Bile Duct.

NECROPSY REPORT: (Positive Findings only). Body is that of a fairly well developed, fairly well nourished, female negro infant, measuring 48 cm. in length. There is a light greenish yellow tinge to the mucous membrane, skin and sclera. Several horse-hair sutures are found closing the umbilicus.

PERITONEAL CAVITY. The peritoneum is smooth, moist, glistening and has a faint greenish yellow tinge. The liver margin is 6 cm. below costal border in right mid-clavicular line. The mesenteric lymph nodes are numerous and average 7 mm. in thickness.

LIVER. Weight: 140 gms. The organ is smooth with sharp edges. The gall bladder notch is prominent. No gall bladder is present. The gall bladder bed is covered with areolar tissue averaging 2 mm. in thickness. No cystic duct, common duct or hepatic ducts are demonstrable. The organ has a faint greenish tinge and an olive green cut surface. The opening of the Ampulla of Vater is not found. No opening into the duodenum common to the bile duct or pancreatic duct is found. The head of the pancreas is normal in relative size and shows the usual lobular markings. Anatomical diagnosis (Gross and Microscopical): Obliteration of extra-hepatic bile ducts and Ampulla of Vater; cirrhosis of liver; jaundice; horse-hair sutures in umbilicus.

MICROSCOPICAL: Sections of gall bladder bed and adjacent liver show a well defined notch. The capsule of the liver in the deepest portion of this notch is greatly thickened and has fibrous projections extending into the liver substance. In this fibrous tissue are found numerous small bile ducts lined with a single layer of columnar epithelium. The adjacent columns of liver cells stain uniformly. A few scattered lymphocytes are present in the stroma. Sections through the area common to the cystic duct and adjacent liver show a similar picture to the above, except

*From the Departments of Pediatrics and Pathology, University of Louisville, School of Medicine, and Louisville City Hospital, Louisville, Ky.

there are small bile ducts in a loose connective tissue, lying superficial to the liver. Numerous arterioles, venules and nerves are found in this connective tissue which is continuous with the septal markings of the liver. There is a diffuse leucocytic reaction consisting mainly of lymphocytes and polymorphonuclear leucocytes scattered through the connective tissue surrounding the bile ducts. Sections through the level of the common duct show numerous bile ducts lying in a fibrous stroma which is diffusely infiltrated with lymphocytes and polymorphonuclear leucocytes. The largest ducts (microscopical size) contain large ovoid cells filled with greenish granules. Some of the cells have an oval vesicular nucleus and appear to be endothelial leucocytes. A few of the large pigmented cells are found in the connective tissue spaces surrounding the ducts. The surrounding connective tissue shows a proliferation of the fibroblasts. Several sections from different areas of the liver show a uniformity in the straining of the liver cells at the periphery and center of the lobules. The bile capillaries are numerous and appear to be proliferating. The connective tissue surrounding the bile capillaries is diffusely infiltrated with lymphocytes. There are scattered endothelial leucocytes throughout the liver substance, the majority of which contain bile pigment in their cytoplasm. The endothelial lining cells of the liver sinusoids contain bile pigment.

Sections of the pancreas show no anatomical variation or leucocytes reaction. Post-mortem Wassermann four plus.

COMMENT

The responsible factor for atresia of the bile ducts is unknown. Due to the embryological formation of the ducts it is presumed that they must have been at one stage of development and that they later became obliterated. This has been explained on the basis of (1) mechanical interference, such as twisting of the mesentery or (2) inflammatory reaction with fibrosis and atrophy. Inflammation is not considered an important factor by the majority of reporters due to the absence of inflammatory cells in the majority of reported cases. However, practically all reported cases showed varying degrees of cirrhosis of the liver.

The above case had a marked inflammatory reaction in the region of the common duct and to a lesser degree throughout the liver. Cirrhosis was of moderate degree, uniformly distributed and the intra-hepatic bile capillaries showed proliferation characteristic of liver cirrhosis.

SUMMARY

A case of congenital absence of the gall bladder with atresia of the extra-hepatic bile radicles and Ampulla of Vater is reported in

a case of congenital lues.

The infant lived 16 days and died following continued bleeding from umbilicus.

Jaundice was very marked.

Inflammatory reaction and cirrhosis of the liver were present.

Successful surgical interference would not seem to be possible in this case.

REFERENCE

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THE MACROSCOPIC DIAGNOSIS OF MALIGNANT LESIONS*

By R. P. BALL, M. D., Louisville.

In the larger surgical clinics of this country there is usually a surgical pathologist present in the operating room during the operative schedule. He serves as a consultant regarding malignant lesions. His diagnosis is rarely questioned by the operator. This confidence on the part of the operator is due to the high percentage of correct diagnoses made by a competent surgical pathologist. The surgeon is familiar with the case history. He knows the age of the patient, duration of the lesion and has already done a thorough examination. He has approached the lesion under question with a scalpel and noted any abnormal relationship. If it is a tumor mass exposed he determines the probable point of origin, vascular supply, degree of encapsulation, consistency and abnormal relationship of adjacent structures. Any part of the above information is of aid and welcomed by the surgical pathologist, but for practical purposes he mainly utilizes the gross and microscopical appearance of the tissue for diagnosis.

The greatest impetus given to the interpretation of clinical symptoms is the performance of autopsies with correlation between the findings and symptoms. This is universally recognized not only by the medical profession, but also by the intelligent layman. Until the middle of the nineteenth century, when Virchow announced that famous dictum "Omnis cellula e cellula," clinical interpretation was based only upon gross findings. Men like Rokitsansky and Marchand evolved lasting explanations for many abnormal lesions of the body presumably from the gross examination of material. They deserve the highest praise for their work, but it is to Virchow that we are indebted for demonstrating the cellular changes which always precede the gross changes. It is not possible to correctly interpret gross changes of tissue without a knowledge of the microscopical

*Read before the Cumberland Valley Medical Association, Harlan, Ky., December 15, 1928.

changes.

The surgical pathologist will, whenever possible, utilize the microscope in making a diagnosis. It will be the final check upon his opinion made from the macroscopical examination. He will consider the microscope an indispensable aid. But in smaller hospitals or isolated communities it is not only impossible, but impractical to have the services of a consultant at the time of operation. The operator under these conditions is called upon to use his own knowledge of surgical pathology. Unfortunately too many surgeons of today are beginning the practice of surgery as a specialty without even the basic principles of surgical pathology. They are placing themselves open to many errors in judgment.

The following criteria for the diagnosis of malignant lesions are gathered from various sources. They will be limited to the gross characteristics because that is the most which an operator can utilize at the operating table. For the sake of brevity and to illustrate by example only certain organs or systems will be discussed.

THE SCALP: The most common lesion of the scalp likely to be mistaken for a malignant growth is the sebaceous cyst. The boggy consistency and butter-like contents identify it immediately. The dermoid cyst is readily differentiated when the contents are examined. This lesion is oftentimes incorrectly diagnosed by the most observant men. It is nearly always of long duration and not infrequently mistaken for a meningocele. This error is the more likely to be made when a roentgenogram shows a pressure atrophy of the outer table of the skull. A simple procedure will make the diagnosis. The aspirated material from a long standing meningocele is not always crystal clear, as we expect to find the spinal fluid. If the fluid is rubbed between the fingers, and they are then dipped in water, the albuminous granular material of inflammatory exudate will be washed off. If the fluid was from a dermoid cyst there will be a greasy material eling to the fingers.

The basal cell carcinoma is the most frequent malignant lesion above the level of the zygoma. It is most often confused with a benign ulcer or squamous cell carcinoma. The favorable reaction of this lesion to radium or complete excision makes the classification of this tumor most desirable. The basal cell carcinoma is in the beginning usually mistaken for a pimple or a wart. It will show definite granulating tissue and oftentimes complete scab formation. The depth of the lesion can be well defined although it may be at any depth. As a contrast the squamous cell carcinoma is a definite tumor mass from the beginning. If allowed to remain until ulcerated, the lower border of the tumor growth is

not well defined, but blends with the underlying tissue.

Fibrosarcoma of the scalp is not a common tumor, but when it occurs as a single growth it is usually the last considered. Its distinguishing characteristic fusiform shape and homogeneous cut surface are the best means of identification. They are usually multiple when present.

THE ORAL CAVITY: Malignant lesions of this region demand the utmost respect and immediate attention. Delayed surgery or incomplete removal of malignant tissue of this area is a fatal error. The squamous cell carcinoma is probably the most frequent malignant lesion. A point in the history is of great importance. Squamous cell carcinoma does not begin as a "pimple" and as found elsewhere, there is no sharp line of extension such as we find in benign lesions. Mixed tumors of the salivary gland type are found in the tongue, soft palate and the lip. The absence of connection between the tumor and mucous membrane covering is the best differential point in the diagnosis. If the cut surface reveals a gelatinous-like substance which exudes from a localized area in the tumor it is almost certainly a mixed tumor.

The jaw tumors sometimes offer considerable difficulty in diagnosis. The most malignant lesion is an osteosarcoma. The diagnosis is usually correctly made previous to operation because of the characteristic history or roentgenograms. Of the malignant lesions most likely to be confused, viz. the osteosarcoma, fibro-sarcoma and adamantinoma, the adamantinoma can be recognized by its cystic nature. It may grow in solid formation and replace the mandible or maxilla, but practically always shows scattered, cystic-like areas containing a gelatinous or serous fluid. Due to the slow extension and delayed metastasis a radical excision of an adamantinoma offers a cure.

THE CERVICAL REGION: Tumors arising in the cervical region are always of doubtful origin and offer the most perplexing problems in differential diagnosis. When the tumor is located near the midline it is nearly always thought to arise from the thyroid gland. In spite of the large variety of malignant tumors found in the neck they are readily differentiated and properly diagnosed when exposed.

The lymphatic glands are a frequent focus of primary neoplasm classified as lymphangioma, lymphosarcoma or Hodgkins' disease. The multiplicity of lesions and excessive size with a chain-like formation of these glands offer the first clew. They are differentiated from the all too frequent tuberculous lymphadenitis by their homogeneous cut surface and absence of caseous areas. Although the

neoplastic cells will invade the capsule of the gland and to all appearances there is a fusion of the lymph nodes, they can be readily separated into distinct glands as compared with the firm fibrous adhesions matting together the tuberculous lymph glands.

A metastatic carcinoma of the cervical lymph nodes is not an infrequent lesion. It is nearly always a squamous cell carcinoma or from the pharynx or larynx. The lymph node is that typical, very firm gland with the characteristic granular cut surface which produces a milky-like granular exudate upon the edge of the knife blade upon continued scraping. This simple scraping of a doubtful tumor is the most constant and reliable single procedure at the disposal of the examiner. The neoplastic cells are growing in clusters and columns or nests and readily dislodged. Every unit of a normal structure is somewhat firmly attached and will not be displaced in sufficient numbers to resemble a scraping of neoplasm if it is done gently. And, as I have just said the granular exudate will be present on continued scraping in the malignant lesion.

The branchial cysts and the thyro-glossal duct cysts are, of course, immediately recognized by their smooth lining and contents. They rarely present a difficult problem to diagnosis except when a neoplasm is primary in the lining epithelium which is a squamous cell type of carcinoma. A malignant lesion of the thyroid gland is not diagnosed correctly previous to operation in 50% of the cases reported in literature. This is readily explained when we remember that over 90% of the malignant lesions of the thyroid are epithelial in origin and to all appearances arise in a pre-existing adenoma of the thyroid. The history of long duration is the deceiving feature. When the gland is removed with the tumor it is extremely difficult to classify it in many cases. Dr. Allen Graham, who has studied tumors of the thyroid gland, over a long period of time, has emphasized an important observation. He calls attention to the blood vessels of the capsule. If they do not collapse, but stand out prominently on the surface of the gland and contain a thrombus it is shown to be a direct extension of tumor cells into the blood vessels. Of course we recognize such an advanced picture as malignancy. However, it must be recalled that the microscopical picture of malignant adenomata of the thyroid is not suggestive of malignancy in a large percentage of cases. The early blood vessel invasion with distant metastasis are oftentimes the first evidence a clinician has to suggest a neoplasm of the thyroid in the presence of adenomata. With a firm adenoma showing a dull white homogeneous cut surface without cyst formation or

colloid deposits and with prominent firm blood vessels on the surface filled with thrombi a diagnosis of malignancy could certainly be made at the operating table.

BREAST: The high percentage of breast tumors and the frequency of operation behooves us to mention them. The most experienced operator changes his opinion of a breast tumor before and after operation in 30% of his cases. After a breast has been amputated because of the presence of a tumor, it is gross negligence to wait for 48 hours or longer for a laboratory report before dissection of the axilla when a malignancy is found. It is extremely rare to find a tumor of the breast which cannot be classified as benign or malignant by a macroscopical examination of the tumor. Any tumor of the breast which is well encapsulated and does not show a granular exudate on scraping is benign. Any tumor of the breast which shows no distinct capsule, with striations extending into the surrounding breast tissue is malignant. A single large cyst is sometimes diagnosed as a malignancy previous to operation. A smooth lined cyst with a fibrous wall is benign. There is an old idea expressed in text-books that a bleeding nipple suggests malignancy. It is rare that a malignancy of the breast is associated with bleeding from the nipple. When a breast of this type is removed and carefully dissected there are found benign papillomata in the mammary ducts which are found responsible for the blood. It is understood that these breasts are to be removed, but only in cases of malignancy is one justified to perform radical mutilating operations when a correct diagnosis can be made.

OVARY: The ovary is an organ which should be preserved in all patients under the climacteric age. Its stroma is rarely invaded by inflammatory exudate although the cortex may be involved in inflammatory adhesions. It is normal for the ovary to show cysts present. A diagnosis must be made with the organ in situ. It is a well established practice and a wise one, to remove all large cysts of the ovary without rupturing them. But many large cysts of the ovary are benign. In general it might be stated that a multilocular cystic ovary filled with a mucoid or gelatinous like fluid which shows papillary excrescences projecting from the inner wall is malignant. Conversely a unilocular cystic ovary with a smooth lining and containing clear fluid is benign. The ovary may show solid tumor growths. A firm, solid ovary measuring more than twice the normal size, should be excised. If an ovary enlarges to twice its size and does not show cyst formation it is to be regarded as a suspicious malignant lesion.

TESTICLE: A large swollen testicle will offer a considerable problem in diagnosis. The notorious early metastasis and high mortality rate from testicular tumors will not permit any delay whatever. One is rarely confused by epididymitis because of the acute pain and inflammation present. But a hematocele or hydrocele with hemorrhage preventing the transillumination of light is an uncertain problem until it is exposed. Malignant tumors of the testicle are notoriously associated with a history of trauma and conservatism is the natural course. It must be remembered that a hydrocele is not an infrequent complication of testicular tumors. You might ask what service a surgical pathologist could offer in a case of this type. It is just the type of case which requires a familiarity with the appearance of malignant tissue in order that a differential diagnosis be made and the organ sacrificed or saved. It is not a serious operation to open the tunica vaginalis. After it is opened the epididymis is exposed and a tuberculous orchitis can be practically ruled out if the epididymis is not involved. A malignant tumor of the testicle is rarely located in the central portion, but more likely to occupy an eccentric position with the tumor near the surface. This superficial location of the tumor can be recognized by its firmer consistency. A small incision into the firm area will give the cut surface of the questionable lesion. There is no other tissue in the body which resembles that of the cut surface of the testicle. It shows a pale yellowish gray, striated surface characteristic of it alone. It is soft and extremely friable. The cut surface of the neoplasm is pale gray, homogeneous and may contain focal areas of hemorrhage or necrosis, but always free from striations.

PROSTATE: The prostate gland cannot be investigated before its removal except by palpation and cystoscopic examination. The urologist will make a correct pre-operative diagnosis in nearly every instance. But this organ, as contrasted with the testicle, is noted for the central origin of neoplastic lesions. The operator can examine the organ only after it has been enucleated. Again you might ask of what use is the surgical pathologist in this case. The answer is that he can tell you immediately, in over 95% of the cases, whether or not you have removed a malignant prostate. In hyperplasia, or so-called adenomata of the prostate, there are found numerous scattered oval or rounded, discrete nodules which when sectioned, bulge above the surrounding tissue. There is a slight contrast in color between the pale yellowish gray nodule and the light grayish stroma or parenchyma of the gland proper. In the malignant prostate there is found a firm nodule

which, when sectioned, does not bulge above the surrounding tissue and has an even whiter color than the adjacent parenchyma of the gland.

GASTRO-INTESTINAL TRACT: Time will not permit a discussion of all the neoplasms of the gastro-intestinal tract. We shall mention malignancies of the rectum because they are sometimes palpable, and always visible when the proctoscope is used. The most frequent type of malignant neoplasm arising in the rectum is the carcinoma which takes its origin in the mucosa. Not infrequently an ulcerated area is found which behooves one to differentiate between a benign and malignant lesion. The malignant lesion is characteristic in many respects. It has the elevated, indurated borders and deep crater which might be present in other ulcerative lesions. However, there is one finding which will identify it as being malignant since it is seldom if ever present in benign ulcers of the rectum and sigmoid. The mucosa is not movable over the muscularis. This feature is readily appreciated when we remember that the origin is in the mucosa and infiltration of the muscularis is the earliest and most pronounced single characteristic of the lesion. Another fairly pathognomonic gross finding is the peculiar arrangement of the mucosal folds. They change from their uniformly spaced and circular arrangement to a position where they radiate out from or converge to the ulcerated area. In other words, a pursestring like constriction is taking place in the wall.

BONE: Malignant neoplasms arising within the bone are nearly always correctly diagnosed by a competent roentgenologist and properly classified before operative intervention. One point only I wish to mention regarding bone tumors. Any solid tumor mass invading or extending through bone which can be cut with a knife is malignant. The tumor can be more readily classified by examining the roentgenogram than by a macroscopical examination.

SUMMARY

In conclusion I wish to emphasize the well established fact that it is surgical judgment which is so important in surgical procedures. And over half the decisions are necessarily made at the operative table. Malignant lesions require early removal with wide excision; it is essential that the operator be familiar with the gross characteristics of neoplasms.

GROUP PRACTICE*

By R. C. BURROW, Cunninghamham.

Before reading my address, I want to assure the Carlisle County Medical Society of my appreciation of being selected to preside over our meetings for the past year, and for making it easy, by their help, to preside with my limited knowledge of parliamentary usages without reproach to myself or our Society. It is because of the harmony always existing, and your never suggesting things out of order that has made this possible.

I once read a definition of "friend," which said, that it is one who knows me, and yet likes me.

I feel that when physicians of my own County do me an honor, that there is a tie of friendship not merited on my part.

The theme of my address was suggested by my observation of a free clinic, for the prevention of Typhoid Fever and Diphtheria. This clinic was held at my residence by our Health Unit at my suggestion. After my observation and experience at this clinic, the thought occurred to me, that no better subject for the address I would be expected to deliver at this time, than the subject of Free Clinics and Group Practice as a remedy.

(I want to pause here to say that there is no blame, or criticism on our Health Unit in this Clinic).

The Health Unit came four times. On their fourth trip, some came for their first and second injections, and another engagement was made. Dr. Galloway asked me to attend to this for him, which I gladly did. About 40 patients attended this Fourth Clinic; some for the first, some for the second, and some for their last injection. When I informed those, who had just taken their first or second injection, that they would have to go to Bardwell for the rest, or pay me 50c per shot for the rest, they left mad, and not one came back.

I had about the same experience a few years back, with a Free Clinic for the removal of tonsils.

Self defense is forcing the physician to commercialize the practice of medicine. One of the greatest problems, as many see it, is the problem of sickness in the members of families rated as "the middle class." The wealthy can command nurses and the best of medical attention. The very poor can go to the free wards in hospitals and get the same attention but the man of medium income, who has a wife and three or four children, is certainly up against it if one of the family develops a case of Typhoid Fever or Pneumonia, or even an ordinary obstetric case. Many honest

members of this class would be glad to have their work done by contract, so that he could pay something each month to have his, and his family's health looked after, if he knew what the cost would be.

The average cost could easily be arrived at.

The "dead-beat" could be shown how he could have a physician when he needed one, at a price within his reach.

Unless "Pay-Clinics" are established, where the "middle-class" can get service that will exceed the service at the "Free-Clinics," "Free-Clinics" will take the day with an increasing number patronizing them, and a further curtailment of the general practitioner's income is the result. I have been surprised to see the people who patronize the "Free-Clinic." It was not only the very poor; neither did it stop at the "middle-class," but some of the wealthiest people in the community attend them.

What might be accomplished by a group of physicians, that cannot be accomplished by one, in the way of equipment, such as X-Ray, pathological laboratory, skilled technician, trained nurse, etc., is obvious. Through group-practice, with such equipment, skilled diagnosis could be cheaply made, whereas each doctor carries his baffling cases from specialist to technician, until he is fleeced and disgusted, and is ready to balk before treatment commences.

Money can be made in group practice, removing tonsils at \$35.00, yet the cost now is:

Surgeon's fee.....	\$50.00
Anaesthetist	10.00
Operating room	10.00
Room 24-hours at hospital.....	5.00
Physician accompanying patient to hospital	10.00

Total.....\$85.00

A Dental Surgeon should be included in this "group-practice." There are too many cases where the infection which causes serious bodily ailments arises from the teeth, and which no M. D. is as well qualified to locate its offender as the dentist.

In fractures of the maxillary bones, the dentist is better qualified to help fit the teeth together for perfect results.

What is considered unethical in one doctor, would be considered ethical in "Group Practice."

Prices can be made public in Group-Practice.

Practice for family of 4, per year.....	\$———
Practice for family of 2, per year.....	———
Tonsils removed for.....	———

If this is not ethical, to H—— with the ethics! It's business.

Propaganda by the business manager to the effect that "Free-Clinics" are for paupers,

*Retiring President's Address read before the Carlisle County Medical Society, December 4, 1928.

and that people of independence had as well call on our Fiscal Courts for food and clothing, as to patronize "Free-Clinics."

Good roads make it possible for doctors to group together, even though they live in different localities, but the office should be centrally located, and should have a few rooms for caring for post-operative cases or for obstetrical cases.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE ACCESSORY SINUSES OF THE NOSE*

By J. F. DUNN, M. D., Arlington.

The nose with its accessory sinuses is the most complex part of the human anatomy. Being composed of protuberances, cracks, crevices, and cavities, with such a small aperture at the inlet, its diseased parts are often reached with great difficulty by the attendant. The general practitioner who has the care of the entire body has not the time to spend in trying to master this great field of study. Neither does he have a large number of nose diseases to examine as the days go by, therefore, he loses interest in this part of the body and naturally turns his attention to other parts more readily accessible, and which will more readily respond to treatment.

Being asked to address you tonight in a manner which will be of interest to the general practitioner, makes it even more difficult as this class of diseases really belong to the specialist and lean more toward surgery than medicine. However, we shall try to consider some diagnostic points and some methods of expectant treatment as well as about all that can be done this side of surgery.

To begin with, I want to say that in order to be able to diagnose a case of sinus disease intelligently we should first be familiar with the normal nose, as the large majority of sinus disease is secondary to some abnormal condition of the nose.

The normal nose is one that has had no knocks or kicks, and looking at it externally it sits straight on the face and both orifices are equal. Internally the septum should be straight and free from spurs and ridges, the turbinate bones should be of equal size on both sides, and should not be enlarged, there should be no congested areas of mucous membrane anywhere along the nasal tract, and there should be no mucous or muco-purulent material seen. This, so far as the general practitioner is concerned, constitutes what might be termed the normal nose. Any deviation from this should lead us to believe that there is some trouble somewhere about the nose or its accessory sinuses.

McKenzie has divided the accessory sinuses into two groups as follows:

1. The anterior group which comprises the frontal sinus, the anterior ethmoidal cells and the maxillary antrum.
2. The posterior group, which comprises the posterior ethmoidal cells, and the sphenoidal sinus.

They are also divided into the acute and chronic types. We shall not consider the chronic types tonight, for the lack of time.

We shall begin with the frontal sinus, which in my estimation is the one most frequently affected. In this as well as the other sinus infections, or infection in any other part of the body, we have malaise, fever, chilliness, aching, and weakness or prostration, which resembles a case of "flu." In fact, they often come in with a sinus infection and tell us they have the "flu" aside from this there is severe pain over the frontal sinus; coming on at the same time each morning. Hence the term "sun-pain" as they often express it. There is marked tenderness on pressure over the sinus, most pronounced at the point where the supra-orbital nerve emerges.

In looking into the nose there may be nothing to suggest sinus trouble, but usually the turbinate of the affected side is swollen and the nostril appears "stopped-up" and may or may not contain pus.

Transillumination is not very reliable in this condition.

TREATMENT

The main thing to do in this as well as the other sinus affections is to establish drainage. This is the reason they suffer so severely in this disease—the inflammation causes a swelling of the mucous membrane which closes the fronto-nasal duct and consequently the fluid cannot escape from the sinus.

As this condition is, in the majority of cases, secondary to an acute rhinitis, we should at once direct our treatment to this locality; render the nose alkaline by using sodium bicarbonate solutions, apply adrenalin chloride solution 1-1000 to the turbinate and rounding parts which will shrink the mucous membrane and have a tendency to open the fronto-nasal duct and thereby establish drainage. A spray of equal parts of chlorotone inhalant and liquid petroleum with a few drops of adrenalin chloride solution is often given for relief of pain.

If these treatments fail to get results, surgery must be resorted to.

MAXILLARY ANTRUM SINUSITIS

As a rule this condition is easily diagnosed. The patient complains of pain over the cheek bone and there is great tenderness on pressure on the nasal side of the antrum. Looking into the nose, we find as a rule, a muco-purulent discharge on the affected side

*Read before the Carlisle County Medical Society.

with engorgement of the turbinates. This together with the usual toxic symptoms will rarely mislead us. Transillumination is a wonderful adjunct in making our diagnosis, the technique of which I shall demonstrate in my closing remarks.

The medical treatment is practically the same as for the frontal sinus; shrink the mucous membrane so as to give ventilation; use antiseptics in the nose, such as argyrol, sylvol, and a weak solution of Potassium permanganate, or a normal saline. If a canula can be passed through the natural orifice into the antrum, irrigate it with some sterile solution.

The tendency of a maxillary sinusitis is to become chronic, in which case, there is a continual muco-purulent discharge often accompanied by a foul odor that is very disagreeable to the patient as well as his friends. The patient also takes cold easily and often has an acute exacerbation with a recurrence of all the initial symptoms, therefore, it behooves us to strive earnestly to prevent these sequelae.

Ethmoidal cell suppuration is attended with practically no pain. About all the patient complains of, is a purulent discharge from the nose and a tendency to take colds easily. The diagnosis is made by excluding the frontal and maxillary sinuses, and by the location of the pus which is found under the middle turbinate and affecting the bulla.

My authorities claim better results from medical treatments here than with the other sinuses. A nasal douche is recommended as follows:

Rx. Potass. chlorate.

P. Sod. Bibarat.

P. Sod. Bicarb. of each four ounces.

P. Sacch. alb. one ounce.

M. $\frac{1}{2}$ ounce in 1 pint of warm water and syringe into nose twice a day.

Follow this up with the chloretone inhalant as a spray. This failing to relieve, surgery should be resorted to.

Suppuration of the posterior ethmoidal cells is usually combined with suppuration of the anterior ethmoidal cells. The diagnosis and treatment are practically the same, so we will pass this and conclude this discourse with a short discussion of the sphenoidal sinusitis.

The sphenoidal sinus is the most deeply situated and inaccessible of all the sinuses, therefore, these affections are often overlooked and wrongly diagnosed. In studying this condition I can look away back and see a few cases of sphenoidal sinusitis that I had several years ago but am just diagnosing them tonight. Possibly some of them were buried and some recovered. Many of the symptoms are often obscure or they may come on late in the attack sometimes the first symptom that

might attract our attention would be some ocular trouble, such as ptosis, strabismus, or amblyopia (sudden blindness). The main symptoms that the patient complains of, is headache, which is located at the base of the brain, about half way between the external auditory meatus and the posterior fontanelle. This pain is often accompanied by some mental disturbance, such as confusion of thought and loss of memory. At this time, pus may be seen trickling down far back into the naso-pharynx. Transillumination or the x-ray are of no value in diagnosing a case of sphenoidal sinusitis. The only positive method of diagnosis is to pass a sphenoidal catheter or canula into the sinus and withdraw some of the pus, but this is much easier said than done.

The only treatment suggested is surgical. Open the sinus and drain.

In summing up, let me state that the treatment of all the sinus infections resolves itself into two main principles, viz: ventilation and drainage. There has been much discussion as to how that can best be accomplished. If it were possible to remove the entire diseased sinus, all would be well, but in the case of the frontal, the maxillary, and the sphenoidal, this can't be done. However, much good has been done by opening up these cavities from without and completely curetting out all of the diseased mucous membrane. Then again the lighter operations, such as passing the catheter or canula and irrigating the sinus will suffice. And last, but not least, the old family physician with his local antiseptics combined with Mother Nature's efforts, will cure more sinus diseases than all the surgeons in the world.

Interstitial Pregnancy.—A diagnosis of ruptured ectopic pregnancy was followed by laparotomy in the case reported by Braddock and Scott. When the uterus and tubes were exposed both tubes were found intact, but on the posterior superior surface of the uterus near the right cornu there was a jagged hole about 2 cm. in diameter, extending through the entire thickness of uterine wall, exposing the mucous surface. On closer examination this "blow-out" was seen to have occurred at the inner portion of the interstitial portion of the tube. The fetus was not identified among the mass of blood clots, which were removed as rapidly as possible. The placental remains were removed from the uterus, and the opening in it was closed with three interrupted chromic catgut sutures. The post-operative course was tedious and slow, but otherwise uneventful.

HEREDITY IN MENTAL DISEASES*

By A. M. LYON, M. D., Frankfort.

I chose this subject from the fact that it is the widest avenue to the goal that will determine society's course in the correcting of mental defectiveness.

Heredity is that biological law by which all life tends to repeat itself in its descendants. It is to the species what personal identity is to the individual. The powers of heredity are carried in the determinants of the germ cell. When conception takes place the gates of heredity are closed. We are all familiar with the fact that in our daily association we can see a resemblance to the parents in children. Often times we conclude who a strange boy is by the resemblance he possesses to his well-known parents. It is familiar to us all to see a generation of people possess a peculiar or odd physical characteristic. For instance, a Roman nose species or a long-armed species, anthropological make-up and so on. We are all familiar with the fact that some families for generations have been tall and slender, others short and stockily built. It is a common occurrence in the practice of medicine to have a clientele of the generation of people who are prone to neurasthenic conditions as well as hysteria. There are people in our acquaintance who are known for their muscular alertness. There are those who are known for their peculiar muscles. Now if these physical traits are a matter of heredity, why shouldn't we expect the highest sensitive system of the human body to suffer equally as great if not greater.

Suppose you allow some duck eggs to be hatched by a hen. In fifteen minutes after these ducklings come from the shell for what will they search? If you should place one in a pond of water, will the mother hen have to tell it what to do? This natural characteristic is known as instinctive heredity. Suppose you cage a young bird and release her at maturity during the season of hatching. She will immediately proceed to build a nest. Take the young squirrel in the fall season. Though he has never had an opportunity to associate with his kind, he will instinctively bury the nut for the winter day. Further still, he can locate that nut under cover of snow which is also a condition that cannot be explained other than instinctive heredity. If this characteristic prevails in the lower animal life, would we not expect it to play a greater role in the higher form of life?

Under the head of Sensorial Heredity will come the special senses. You are all familiar with the fact that there are families who are known for generations to have visual disturb-

ance that can only be corrected by glasses. Probably in some instances repeated cases of total blindness down through a generation may also be known by you. Not only the function of the eyes is inherited but the anatomical make-up is recognized and compared from father to son. Also the color of the eyes is another characteristic that is well established from parent to off-spring that cannot be explained other than from the sources of heredity. Therefore, if it is a well known fact that the most complicated and sensitive organ known to science, is affected by heredity, why shouldn't we expect the nervous system to suffer in ratio to this sensitiveness.

Take the special sense of hearing. You have probably come in contact with families who will tell you that all of their people cannot hear well. Can you recall an instance where there is a strain of deafness in one particular family for generations. Of course, I mean to exclude pathological infections. Likewise the different degrees of intensity of the special senses may be singled out as manifested in various families for many generations.

If these physical facts are manifest, why shouldn't it be possible for the psychological elements to suffer or gain from the powers of heredity. Permit me to reiterate that this power of heredity is carried in or by the ultra-microscopic determinants in the germ plasm.

There are certain laws by which heredity operates. Direct heredity is that similarity of off-spring to parent. Under this heading there are two classes: (a) where children resemble both parents, (b) where resemblance is manifestly greater to either father or mother and under this group there are two classes: (b-1) where they are of the same sex, for instance, a son to father and (b-2) where they are of different sex, for instance, a son to mother.

The second type is known as reversional heredity or atavism. Under this head comes the peculiar and striking condition where the boy or girl will resemble the grandparents or great-grandparents. A likeness that has been dormant for probably a generation.

The third division is indirect or collateral heredity. This type is somewhat rare yet we sometimes meet with this peculiar condition, as illustrated: a nephew would resemble a great-uncle and a niece resemble a great aunt.

The fourth type is resemblance or heredity of influence.

Probably the greatest outstanding experiment recorded in scientific literature of generation duplication and reduplication is that of the well known Austrian Monk, Gregor Mendel. He had charge of the flower gardens of Brunn. In the year of 1865 in a remote and secluded section, practically alone, he

*Read before the Franklin County Medical Society, March 7, 1929.

worked out in the vegetable kingdom a theory that has been complimented by biologists through the succeeding ages, and they recognized that maneuver in nature as the Mendelian theory. He made his experiment with the common pea, using the tall and dwarf variety. In the flowering period of the two types of peas both being self fertilizing he removed from the dwarf variety the stamen, thereby forcing the flower of the dwarf variety to be impregnated by the pollen of the tall variety. An equal number of seeds from both varieties were planted in the following year. All of this planting produced tall peas. The seed from the second crop from the beginning of the experiment was planted, resulting in the three tall to one dwarf. This experiment was repeated many times and in each instance the result was three to one. Consequently from that experiment the Austrian Monk is at this time internationally renown.

The two great authorities, Drs. Shuttleworth and Potts, applied the Mendelian theory in amentia as follows:

No. 1. If two normal parents, both of whose families are free from mental defect, have children, all those children will be normal; and, in addition, the children will be incapable of transmitting mental defect to their off-spring.

No. 2. If a normal person whose family is quite free, marries either a mentally defective person or one who, though normal, is a carrier of the defect, then, although all the children will be normal, a certain number will be carriers of that taint. If the second parent is actually defective, half the children will carry it; but if the second parent carries it, without showing it, only one in every four of the children will carry the defect in its germ cells.

No. 3. If both parents are apparently normal and yet both carry the taint, then one in every four of their children will be defective and, in addition, two out of every three of the normal children will carry the defect, while one only will be entirely free.

No. 4. If both parents are defective, every one of the children will be defective.

It is necessary to point out that if mental defect is of a Mendelian recessive character, segregation cannot stamp it out in a generation; the good effect of segregation will only gradually become apparent. The Mendelian theory explains the deep-rooted objections of cousin marriages, the danger being that if one parent carries mental defect in his germ-cells; the other parent will very likely do so too; the results of such a union are sometimes disastrous. The Mendelian theory enables us also to understand how a parent may have only normal children after one marriage; and defective children after a second

marriage.

There accompanies in most or many instances certain physical deformities which are known as stigmata of degeneracy, an outline of which I will be pleased to submit if you care to look it over. Many of these deformities may be found in the mentally normal, but if three or more are found it invariably designates mental defectiveness.

It is safe to say that heredity plays a sixty per cent role in amentia. Many scientists attribute a greater per cent than that. This I am sure is conservative. I am sure that one-third of the population of the penal institutions are mentally defective in some way or other. A greater per cent of which is heredity, therefore, organized society must carry heredity penalties. It is, therefore, evident that unless organized society through science, recognize the great financial burden, not to speak of crime, and put forth some effort to check it, the load will become so great that it will be almost unbearable in the next two or three generations. An immense effort is put forth in a conjectural way to where we will go in the end. But little effort is put forward to educate the public as to where we come from and how we get here.

After all there are but four ways by which we may check or correct the great flux of amentia of organized society.

No. 1. Education which in itself is explanatory.

No. 2. Legal Restrictions. Under this head are all cases of incurable mental defectives and confirmed criminals, as well as blood relation should not be permitted to marry. There should be a physical as well as a mental standard for those contemplating matrimony if we should have a perfect race. Scientifically speaking there is no objection to relatives marrying provided there is a positive assurance that there is no detrimental determinants in the germ plasm.

No. 3. Segregation. An effort of which this institution is a symbol. Forty per cent of our population are retained here solely for the purpose of prohibiting reproduction. If you plant beans you would expect to reap beans.

No. 4. Last but not least comes sterilization. I am thoroughly convinced that this is the most scientific way to assist in prohibiting the potential parenthood from bringing forth inadequates. If the first of these four methods should fail apply the second; if the second should fail, apply the third; and then the fourth. Purify the race regardless of cost.

I am not trying to convince you that all amentia is caused through the channel of heredity. I regret to say that it does not work out with arithmetical precision as do the problems of the more exact sciences. But it is well

worth our time and efforts to pursue the maneuvers of heredity when possible. Neither do I think that sterilization is a panacea to relieve society of her charitable burden. If it is a scientifically proven fact that sixty per cent of amentia is caused through the channel of heredity and it can be obliterated by sterilization, why would it not be an economical course to pursue by putting it into force? I am sure that if this Commonwealth could make an investment of sixty per cent profit that the authorities in charge would need no persuasion to make that investment.

Organized societies whether they be governments, municipalities, welfare leagues, or what not, when they open their eyes will readily conclude that a great part of their charitable burden can be solved only through biology. Every child born is entitled to be born free from mental disease and physical handicap. He is entitled to start life's battle unhampered by handicaps that this modern age can ward off. This problem rests upon men of science who are laboring shoulder to shoulder with you. If there is an Unseen Power that can direct an unicellular mass of proto-plasm and cause it to develop into a human being, it is our duty to furnish it an unhampered right of way to maturity. Society's success in attaining a better, higher and healthier off-spring, both mental and physical, will materially decrease the pain, discomfort and agony of the millions yet unborn.

Investigation into Cause of Ascites.—This study by Bose and Banerji shows that ascites of nonrenal, noncardiac and apparently nonhepatic origin is common among adult Indian males in Behar. The poorer classes are mostly affected. It is a chronic and progressive disease associated with bacillary dysentery (84 per cent) and with kala-azar (31 per cent). The renal and cardiac functions are good in the majority of cases. There is evidence of impaired function of the liver in 84 per cent of cases. The ascitic fluid is a transudate with a preponderance of endothelial cells. It is not tuberculous in origin. In the cases with no history of kala-azar, a definite relationship with bacillary dysentery is established. In the absence of sufficient evidence in favor of cirrhosis of the liver, tuberculosis or inflammation as etiologic factors, a mechanical origin of the fluid due to disturbance of the absorptive power of the upper part of the peritoneum caused by previous dysenteric infection seems probable.

PEPTIC ULCER*

By C. W. JUSTICE, Ludlow.

Gastric ulcer is a loss of tissue in the mucous membrane and deeper coats of the stomach characterized clinically by epigastric pain related to food intake, vomiting and haematemesis. May be acute or chronic. The two forms varying considerably.

ETIOLOGY

Sex: Acute gastric ulcers are more common in females than males, the ratio being three to two, while chronic ulcers are about equally divided.

Age: In females usually between twenty and thirty years; in males between thirty and forty-five. May occur at any age from infancy to old age.

Occupation: Among women, chlorotic, dyspeptic servant girls seem very prone. Cooks and shoe makers.

Trauma: Ulcers have been known to follow a blow in the region of the stomach.

Associated diseases: Anemia, chlorosis, cardiac, arterio-sclerosis and diseases of the liver. T. B. and lues have been considered.

Alcohol and heredity seem to have some bearing.

Infection: This is the most important factor, any focal infection may be responsible, especially tonsils and sinuses. Other associated abdominal infections, as in the appendix, gall bladder, both may have come from a common source or the ulcer may be secondary to the other.

Hyperacidity: Experimental gastric ulcers in animals heal rapidly unless acidity of the gastric juice is artificially raised. Possibly the gastric mucous membrane is subject to abrasions during digestion which normally heal rapidly but lead to ulcers in presence of hyperacidity.

MORBID ANATOMY AND GENERAL DESCRIPTION

Acute Ulcers: Most commonly multiple on the anterior wall near the lesser curvature, varying in size from a pin point to a half a dollar. The appearance is a small, punched out ulcer; edges clean cut; floor smooth; base formed by submucous, muscular or deeper layers; walls terraced, each layer being less effective than the next superficial; oedema and congestion in the neighborhood. Hemorrhage rarely fatal. Perforation frequently results in general peritonitis.

Chronic Ulcers: Rarely multiple. Eighty per cent are located in the posterior surface near the pylorus. They are larger than acute ulcers. Peabody reports one 19 x 10 C. M. involving both the anterior and posterior walls, often giving rise to what Mornihan calls "kissing ulcers." The appearance of chronic ulcer is affected by fibrosis and con-

*Read before the Campbell-Kenton Medical Society.

traction. The edges and walls are irregular and indurated. The floor may be smooth or scarred, formed by deeper layers of the adherent organ usually the pancreas. Inflammatory changes in the neighborhood. Hemorrhage not uncommonly fatal. Perforation less common than in acute ulcers.

Mode of Healing: Granulation tissue spreads in from edges. Acute ulcers heal with little scarring or sequelae. Chronic ulcers after years may show no healing or extend in one direction while scarred in another.

PATHOLOGICAL EFFECTS PRODUCED BY AN ULCER

Perforation: On the anterior wall in 70% of the cases. More frequent in acute ulcers (from mobility of stomach and absence of adhesions); hence total incidence greater in women; but of perforated chronic ulcers, over age of thirty more occur in men. The results depend on sight, size of perforation and adhesions. (1) generalized peritonitis, especially from anterior wall and acute ulcers. (2) localized abscess, that is, chronic ulcer ruptures into lesser sac, and produces subphrenic abscess. (3) very rarely perforates into adherant intestine, usually into the transverse colon. Very rarely into the pleura or pericardium.

Erosion of Blood Vessels: Hemorrhage, frequent both in acute and chronic ulcers, more often fatal in the latter from exposure of deeper and larger arteries.

Cicatrization: Acute on healing usually leave small harmless scars, from chronic ulcers serious results as pyloric stenosis and hour glass contraction. Pyloric stenosis caused dilatation of the stomach either by scarring, spasm near the ulcer or adhesions and kinking of the duodenum. The hour glass contraction is caused by the ulcer usually on the lesser curvature involving the anterior surface. The constriction divides the stomach into two pouches, the orifice may be as small as a pencil.

Perigastric adhesions: Follow chronic ulcers very frequently, especially on the posterior surface or near the pylorus. They tend to prevent healing but diminish the risk of perforative peritonitis. The pancreas is involved in about fifty per cent of the cases. The liver in about twenty-five per cent and less often the colon, spleen and mesentery. Gastric adhesions also occur in disease of the gall bladder, pancreas, syphilitic liver and tuberculosis. The adhesion may impair motility and cause pyloric obstruction and hypertrophy of the stomach.

Symptoms: Pain in the epigastrium, definitely related to food; vomiting, haematemesis; increased total acidity and free hydrochloric acid in the gastric contents. The gastric ulcer usually begins in one of three ways, first, latent. First, symptom haematemesis or even

perforation, especially in acute ulcers. (2) dyspepsia may exist for years before definite symptoms. (3) definite symptoms occur early.

The pain is rarely absent, usually just below the ensiform and is usually localized. Frequently in the back and the tenth dorsal vertebra. The pain may shoot through or spread around the left side. In chronic ulcers the pain is often lower in the epigastrium and more diffuse. The pain occurs regularly one quarter to two hours after meals. Rapid onset suggests ulcers at the cardia, but interval may be brief with ulcer at pylorus. The pain continues until the food passes through the pylorus or vomiting empties the stomach. It is not continuous though in severe cases discomfort may be persistent. It may be burning or heavy or in severe paroxysms. The pain is increased by pressure even by weight of the clothes for that reason the patient oftentimes wears the waist band very low. There are sharply defined areas of superficial tenderness usually between the ensiform and the left costal margin, less often a similar dorsal area between the seventh and eleventh dorsal spine, slightly to the left. The cause of the pain and the hyperaesthesia is thought to be a viscerosensory reflex. The tenderness probably due to the localized spasm of the rectus. No reliable evidence as to the sight is afforded by the position of the pain and tenderness or by time of occurrence after food except ulcers immediately affecting the cardiac orifice.

Vomiting: Is common but not invariable, usually occurs at the height of the pain, most generally giving relief from the pain.

Hematemesis: Is present at least one-third of all cases. A patient may feel faint and turn pale and sweat; the next day the stool may be tarry from the blood that has passed into the small bowel. The bleeding may be latent (occult). These concealed hemorrhages are often small and the blood is not readily seen in the vomitus or stool. These latent hemorrhages may cause a slowly progressive anemia. More commonly the bleeding is profuse and the blood may be in such quantities and brought up so quickly that it is fluid, bright red in color, and quite unaltered. When it remains for some time in the stomach and is mixed with the food it may be greatly changed, but the vomiting of the large quantity of unaltered blood is very characteristic of ulcer. Profuse bleedings may occur at intervals for many years. Death may follow directly. From sixteen to eighteen per cent of the fatal cases are due to it. The immediate effect of the hemorrhage is a severe anemia, from which it may take months to rally; slight fever is common. Rare and untoward effects or convulsions, sometimes only the usual convulsion or extreme cerebral anemia from

which recovery takes place or they may precede a hemiplegia, due probably to thrombosis. Amaurosis may follow the hemorrhage and unfortunately may be permanent, due to degeneration of the retinal ganglion cells or to a thrombosis of the cerebral arteries or veins.

Gastric Contents: Acidity both total and free HCL is increased. With Ewald's test meal, average total acidity 55 to 60 c. c. decinormal HCL per cent while the normal is 40 to 50 and the free HCL is 35 to 40, while the normal free HCL is 20 to 30.

Other and less characteristic symptoms: A patient often has good appetite but on account of food phobia does not eat enough. They complain of flatulency and chronic constipation. In acute ulcers the patient is pale and flabby while in chronic ulcers he is more cachectic.

PROGNOSIS

Acute ulcers are more amendable to medical treatment, but grave complications may occur even before the digestive symptoms have been very pronounced. The chronic ulcer may last for years—12, 18 or even 20 with intervals of good health. Medical treatment is indicated in different conditions than surgical. In the early stages medical treatment is advisable and should have a thorough trial. With a chronic ulcer it may be a waste of time to attempt it. Many cases do well with medical treatment, others are not helped. Surgery is not always successful, for gastroenterostomy, which is done so often, cannot be regarded as a physiological operation. The mortality of the chronic peptic ulcer in the hands of such experts as the Mayos and Moynihan is very low.

The x-ray examination is of the greatest aid and may be the only means by which we can distinguish gastric from duodenal ulcers.

TREATMENT

1. The control of the foci of infection. 2, the obtaining of gastric rests, so far as possible, and 3, the neutralization of acidity. Unless there are definite indications for operation it seems wise to try the effect of medical treatment but this should be carried out systematically. The control of infection demands proper treatment of any foci especially the mouth. The control of gastric acidity means that there should not be free HCL in the stomach either while food is contained there or during the night. The patient should be at rest in bed and kept there for several weeks on a regulated diet and proper alkalies. For the bowels the use of salines in the morning is usually best or enema may be given. When a hemorrhage occurs the patient should be put under the influence of opium as rapidly as possible. No attempt should be made to check the hemorrhage by administering medicines

by the mouth; as the profuse bleeding is always from an eroded artery, frequently from one of considerable size, it is doubtful if acetate of lead, tannic and gallic acid, and the usual remedies have the slightest influence. Nothing should be given by mouth except small quantities of ice. Our surgical colleagues should be called in to help shoulder the responsibility for curing the following: First the ulcer which does not respond to rational medical treatment, i. e.; persistent pain; second recurrent hemorrhages, but never for the first bleeding and rarely for the second because the source is not likely to be found; third, perforation, which calls for immediate operative action as a life saving measure; fourth, obstruction; fifth, to clear up other existing pathology, such as cholecystitis and appendicitis, also intraabdominal adhesions; sixth, ulcers of the stomach with malignancy suspected. The simple non-indurated ulcer is, in the majority of cases, a medical disease. A chronic indurated form is best treated surgically.

Duodenal Ulcer: Is a loss of tissue in the mucous and deeper coats of the duodenum, characterized clinically by epigastric pain, eased by taking food, by melena, and by high gastric acidity.

Etiology and Morbid Anatomy: Majority in males, usually occurs after thirty years of age, is located in the first part of duodenum in 80 to 90% of the cases, usually within two inches of the pylorus, never below the biliary papilla; in other words, in the region acted on by the acid fluid from the stomach. Generally on the upper portion of the anterior wall. Occasionally difficult to decide if the ulcer is pyloric or duodenal. Mayo gives pyloric vein as the line of demarcation. They are usually single frequently sequelae of burns, the real cause is unknown possibly a septic emboli. Murphy sums up the supposed causes into hyperchlorhydria, focal infection, embolism and thrombosis, and disturbances of the organs of elimination. The complications and sequelae resemble those of gastric ulcer except that carcinoma is extremely rare.

Symptoms: Initial symptoms, 1, latent, initial symptom perforation or serious hemorrhage, or a scar found post mortem; 2, indefinite dyspepsia; 3, chronic characteristic symptoms; 4, dilatation of the stomach.

Characteristic symptoms: 1, pain eased by food; 2, melena; 3, increased gastric acidity. Attacks frequently intermittent but extending over many years.

Pain: Occurs when the stomach is empty, about two hours after food or often at night; eased by foods, probably due to closure of the pylorus and protection of ulcer from acid gastric juice. The pain is not eased by vomiting. The location of the pain is to the

right of the epigastrium, and above the umbilicus. The pain radiates to the epigastrium, umbilicus, and the right side, never to the subscapular region (as in hepatic pain). Definite localization is unusual. There may be rigidity of the right rectus, and an area of superficial tenderness. Occasionally the pain is in the center or even to the left of the epigastrium probably due to pylorospasm.

Hemorrhage: Melena may be slight or severe but often repeated, not rapidly fatal. Tarry stools or melena may pass through the bowel without being recognized by the patient. Haematemesis may also occur, depending on the site of the ulcer. The total acidity averages about 70 and the free HCL about 45.

Treatment: With short history and no evidence of hemorrhage, medical treatment should be carried out as in gastric ulcers, the essentials being rest and prolonged treatment on a definite scheme. DaCosta says the operation should always be recommended as soon as positive diagnosis is made due to the seriousness of hemorrhage and perforation. Medical treatment should be carried out for some weeks after the operation as if the operation had not been performed.

RESECTION OF PORTION OF SMALL AND LARGE INTESTINE: CASE REPORT*

By FRANK P. STRICKLER, M. D., Louisville.

I am reporting this case, not because it presents anything unusual from a technical point of view, for the technique employed was that which is generally accepted as the best for resection of the cecum, ascending colon and lower ileum and any general surgeon should be capable of executing this technique.

This case is of interest however, from the standpoint of pathology. The most frequent cause of obstruction in large intestine is malignancy, then we have tuberculosis, actinomycosis, syphilis and inflammatory changes, usually secondary to a diverticulitis.

We consider this to be a case of syphilitic or inflammatory obstruction and therefore a fairly rare condition.

CASE REPORT

Patient: Leather Peacher, female, colored, aged 28 years, married four years. Patient referred from gynecological clinic to hospital, with diagnosis of "bilateral salpingitis."

Chief Complaint: Pain in lower abdomen, griping in character, (of several months' duration): Patient dates all the beginning of her bad health to one year ago when she would have a full feeling in stomach after meals,—would not belch but would eructate

some bitter fluid into mouth, (Appetite was always good). Gradually these symptoms became exaggerated and she would become nauseated and would vomit a bitter greenish fluid. As these attacks came on she would experience a pain in the lower abdomen, right side. Pain was dull at first, then gradually became more acute. Pain would cease when vomiting was over. Has had pain in both lower abdominal quadrants. Pains have never been constant. It was after one of these spells that the patient came to the hospital. History negative for hematemesis or jaundice of sclera. Is usually constipated.

Family history: Father living and well. Mother died following child birth 17 years ago.

Two sisters and two brothers living and well.

One brother killed. Two sisters dead: one died of "bronchial" trouble (?)

No history of cancer, tuberculosis, diabetes, gout, goitre, lues or gonorrhea.

Personal History: Health always good. Had measles and whooping cough when a child. History negative for smallpox, typhoid fever, malaria, scarlet fever, tonsillitis, or acute rheumatic fever. Had influenza in 1918; recovery good. Head, ears, eyes, nose, negative. Mouth, has a few bad teeth. Chest and heart negative except for occasional palpitation. Genito-urinary: some burning on urination; no nocturia; no vaginal discharge; venereal history negative.

Weight: usually 180-190 pounds, has lost 50 pounds in 14 months. Menstrual history: normal.

Nervous System: Occasional sinking, weak spells in last year. Not easily excited.

Marital: Married twice. Lived with first husband 11 years. First husband's health good. Has been living with present husband 4 years. Neither had any venereal disease. One pregnancy: miscarriage at 2 months; no other pregnancies. Puerperium normal.

Physical Examination: Patient is an adult female about 28 years of age. Good development and nutrition. Physical examination essentially negative except abdominal examination. Striae of pregnancy present. Moderate panniculus adiposus present. Tenderness in right lower quadrant. No masses palpated.

Vaginal Examination: Mucous membranes reddened and moderately inflamed. Uterus posterior. Firm masses palpated in each adnexal region. Tenderness especially in right adnexes. Uterus partially mobile and painful on motion.

Impression: "Bilateral salpingo-oophoritis."

Patient remained in hospital four days with normal temperature, pulse and respiration; no nausea or vomiting or untoward symp-

*Read before the Jefferson County Medical Society, November 5, 1928, with exhibition of patient, specimen, and lantern slides.

toms.

A pelvic laparotomy was done on August 28, 1928, by the Assistant Resident in Surgery, Dr. Fisher. A fibroid uterus was found and it was removed with both tubes. When we searched for the appendix we found the lower 18 inches of the ileum to be markedly thickened and enlarged to about the size of the ordinary ascending colon. It was not distended. Was traced to the cecum. The cecum was slightly reddened and contained a smooth mass in its medial wall which felt to be about the size of an ordinary lemon. The appendix lay along the medial side of the cecum and was attached to it by a few adhesions at its base. The omentum was adherent to the cecum at one area for a distance of about 1 cm. which was loosened without any great difficulty. The ileocecal valve did not admit the little finger. We thought we were dealing with malignancy of the cecum and ascending colon, so a lateral anastomosis was made between the middle of the transverse colon and a portion of the ileum about 18 inches from the cecum. The abdomen was closed without drainage, expecting in a few weeks to do a resection.

Convalescence normal; allowed out of bed on thirteenth day. On September 18, 1928, given a barium meal and anastomosis was found to be functioning, patient having normal fecal movements, no nausea or vomiting or distention.

Patient allowed to regain strength and to build up general health until September 29, 1928, when the ascending colon and the hepatic portion of the transverse colon and the terminal 12 inches of the ileum were removed by Dr. Strickler. Gross examination of the specimen showed the serosa of the cecum to be reddish gray and ragged. The ileocecal valve was practically obliterated due to a firm fibrous deposit in the wall of the cecum, mucosa of cecum was not ulcerated; wall of cecum averaged 12 mm. in thickness. Appendix was reddish gray and somewhat adherent to the cecum by fibrous adhesions. A pathological diagnosis was made of: Chronic appendicitis; chronic typhilitis; obstruction of ileocecal valve.

Convalescence has been about normal except for a stitch abscess and an abscess in each leg where infusion needles were placed, which has delayed her going home.

Laboratory Work: Urine negative except for a few pus cells and bacteria leucocytes 5,950. Erythrocytes 3,500,000. Hemoglobin 62%. Leucocytes 9,800. 80% polymorphonuclears. 20% lymphocytes. Wassermann, negative.

Spinal Fluid: Sugar 66.6. Globulin, negative. Cells, 3 per high power field. Wassermann, negative. Stools, negative.

The post-operative treatment was as follows: Morphine gr. 1-6 every 3 or 4 hours, very limited amounts of fluid by mouth for five days. Hypodermoclysis or normal saline about 2000 c. c. daily for six days. And let me digress a moment to state that I do not approve of the administration of saline in the thigh by hypodermoclysis, as I have seen several cases which were complicated by abscess formation. I have never seen a case complicated by abscess formation where hypodermoclysis was used under the breast or in the axillary space. I do not feel that this type of administration interferes in any way with the patient's respiration.

A colon tube was left in position for six days. An enterostomy in the ileum was not done in this case in view of the fact it had been a two-step operation.

The patient passed gas and feces through the colon tube. Liquid diet was given on the fifth day and the patient has made a good post-operative recovery.

I wish to express my appreciation to Dr. Ball for interest in making the pathological study of this case.

DISCUSSION

Robert P. Ball: The specimen consisted of a portion of ileum, cecum and ascending colon. The cecum had a very small lumen, the wall was fibrous and averaged about 15 mm. in thickness. Instead of being rounded the cecum was somewhat tubular. The induration and fibrosis extended well beyond the ileocecal valve into the ileum. The ileocecal valve was narrowed to an opening about 2 mm. in diameter. There was no diverticulum extending from the ileum.

The unusual feature noted was a large inflammatory mass involving the terminal ileum, cecum, appendix, etc. The specimen which I am exhibiting shows the mucosa intact at the ileocecal valve. The fresh cut surface will give you an idea of the type of tissue and also the intense inflammatory reaction. At the lower portion of the specimen where a match is inserted, the appendix may be seen protruding through the mass of inflammatory granulating tissue.

We have made many sections from different parts of the mass and will show some of the microscopic slides on the screen. Minute examinations were made with the idea of determining if possible the etiology. The sections we have made exclude malignancy, and there is an intact mucosa which would likely not be present in tuberculosis. Sections through the wall did not show any mitotic figures nor typical giant cells. Small sections were impregnated with silver nitrate in the attempt to demonstrate spirochaetae pallida, but none were found. However, that does not exclude the possibility of lues. Later I expect to examine sections of known luetic tissue in connection with sections from various parts of the tumor mass, and if no spiro-

chaetes are then found we will be more certain about the matter. The presence of marked leucocytic reaction and intact mucosa indicate that the lesion is infectious and not specific in origin.

The first section shown is that of the appendix. You will note an intact mucosa and a large amount of lymphoid tissue in the submucosa. The muscularis and subserosa is fibrosed and contains numerous mononuclear leucocytes. The serosa has attached fibrous tags. In some areas beneath the serosa are found numerous polymorphonuclear leucocytes.

The second section is through the wall of the cecum. Again note the intact mucosa and marked fibrosis of all layers of the wall. Mononuclear leucocytes are scattered throughout and in some areas you can see the mass of leucocytes suggesting a miliary abscess. No multinucleated cells typical of tuberculous giant cells are found. The blood vessels do not show a characteristic perivascular infiltration suggestive of lues.

I shall not take time to show more sections, because the histological picture is about the same in all and varies in degree only.

CANCER OF THE COLON*

By JOHN R. WATHEN, M. D., F. A. C. S.
Louisville.

Cancer is still the scourge of the civilized world and attacks all classes and races.

With the exception of the stomach, the colon is the site of more cancers than any portion of the alimentary tract.

Lockhart-Mummery, of London, has recently collected 1006 cases of cancer of the colon, not including the rectum, and Judd, of the Mayo Clinic, has reported 333 cancers of the colon as follows: Cecum and ascending colon 47.4 per cent; hepatic flexure 8.7 per cent; splenic flexure 7.2 per cent; descending colon 13.8 per cent; and transverse colon 22.5 per cent. Judd also reported 292 cancers of the sigmoid flexure.

These figures correspond very nearly with those of most of the larger clinics throughout the world, and show that the most cancers are found in the cecum and sigmoid. Cancers of the rectum have been excluded in this paper which refers to the colon only.

This paper is based upon my experience in sixteen cases of cancer of the colon, covering a period of the last twelve years. Six cases occurred in the cecum and ascending colon; one case in the hepatic flexure of the colon; three cases in the transverse colon, all three involving the stomach as well; two in the descending colon, and four in the sigmoid or at the junction of the sigmoid and rectum.

Rankin, of the Mayo Clinic, says that right colonic cancers are most frequently located at the juncture of the hepatic flexure with

the cecum, rather than as is usually supposed at the ileocecal valve; while Lockhart-Mummery says that the commonest situation for the growth to start is at the ileocecal valve, other situations being on the posterior cecal wall, the junction of the cecum and ascending colon, and in the appendix.

Adeno-carcinoma is the type usually found and the various different types often described are due to degenerative or other changes. Males are more often victims of colonic cancers than females, and they usually occur in the fifth and sixth decades, although some cases are reported in young adults of fourteen and fifteen years.

The symptoms of cancer of the colon vary in the different segments involved and this is due to the difference in the physiology of the various parts attacked.

In the right colon symptoms of acute obstruction seldom occur unless the cancer has progressed very far and there is a large mass, and scirrhus or ring-carcinomata are seldom found in this region.

The intestinal contents are usually liquid and can be made to pass most obstructions. Diarrhea is more common in this region than is constipation and anemia without loss of blood is a very striking symptom often causing suspicion to be directed to the right colon.

In thin subjects who have had some loss of weight, quite often a mass can be palpated through the abdominal wall.

This area of the colon offers the best prognosis in surgical treatment for the reason that the diagnosis can be made earlier, metastasis takes place later and the region offers less mechanical difficulties.

In the transverse colon obstruction is most often in some degree present especially if the cancer is located near the splenic end of the transverse colon.

The intestinal contents in this segment are changing from fluid to solid.

In the left colon constipation and obstruction are the outstanding symptoms. Prognosis in this area is less satisfactory than in the right colon, as metastasis occurs sooner and the parts do not lend themselves to surgical manipulations as readily as the right colon.

The greatest and most reliable aid to early and correct diagnosis, is furnished by the x-ray plates, which if made in sufficient numbers and with due care by those of experience in interpreting them, afford a very valuable and accurate picture of the exact pathology and its location.

The surgical treatment of cancer of the colon begins with a proper appreciation of the debilitated patient, due to the anemia so often found in right colonic malignancy, and due to the obstruction which occurs so fre-

*Read before the Jefferson County Medical Society.

quently in left colonic cancers.

The proper cleansing of the whole intestinal tract, the administration of large quantities of fluid and quite often the use of blood transfusion to restore the debilitated patient to better conditions, are the first essentials in preparation for a successful operation.

The right colon can quite often be removed at one stage, while most operators of experience have well agreed that the left colon should be handled by graded operations. The cecum, ascending colon, and hepatic flexure with the first portion of the transverse colon can usually be mobilized by cutting the outer leaf of peritoneum and rotating the colon with lymphatics and blood supply attached to the mid-line of the abdomen. The large intestine is then divided between clamps with the cautery and the edges inverted. The ileum is then severed about eight inches proximal to the ileocecal valve and likewise inverted in the same manner as the large intestine.

After the peritoneal flap has been sutured and the duodenum and posterior structures well covered, an ileocolostomy by a lateral anastomosis can be easily made without opening either the large or small intestine avoiding fecal contamination if we use the basting stitch as advocated by Kerr, of Washington, or the method of Rankin, with his ingeniously constructed clamps.

The most important step of the operation is yet to be done and one which we believe has been responsible for better results in recent years, i. e., an ileostomy about nine inches proximal to the anastomosis, by introduction of a rubber catheter into the small intestine, after the method of Witzel, and bringing the catheter outward through the omentum, which is attached to the abdominal wound at the lower angle of the incision. This avoids all gas distension which is so dangerous.

The catheter we prefer to leave open and allow it to drop into a bottle similar to when we wish to drain a gall bladder. This tube allows gas to escape, fluid if wished, to be introduced into the intestine, and usually comes away of its own accord in about ten to twelve days.

The post-operative treatment is also very important and we have ceased to allow water by mouth or by rectum, as proctocolysis, for at least four or five days. The fluids are administered by hypodermoclysis in the axillae. This avoids all peristalsis and allows the intestinal anastomosis to heal without any disturbance.

In those cases of obstruction so often encountered in the transverse, splenic and descending colon, a cecostomy alone without exploration, is the safest and best procedure.

Later when the patient is in better condi-

tion, a complete exploration and possible resection of these segments of the colon can often be successfully done. The Von Mikulicz operation, where the sigmoid, with its tumor, can be brought through the wound, sutured and later excised, on account of its ease of performance, made very popular this method. This method brings the cancerous growth in direct contact with the cut surface of the abdomen and the percentage of recurrences therefore has been very high.

We have always preferred to clamp the segment and entirely remove the same with the cautery; suturing the two parts of the colon together as in the Mikulicz operation, and later opening the clamps. This procedure does not allow the carcinomatous mass to come in contact with the wound edges. Later the intestine can be restored and the fistula closed after the method suggested by Mikulicz.

CONCLUSIONS

Progress in colonic surgery in recent years has been due to:

1. Earlier and better diagnosis by the x-rays.
2. Better appreciation of the advantages of the two stage or graded operations.
3. Introduction of ileostomy tube for escape of gas to relieve pressure on the anastomosis.
4. Avoidance of fluids by mouth or rectum for four or five days, using hypodermoclysis only to avoid peristalsis.
5. Use of aseptic methods of anastomosis, avoiding any contamination, by opening neither the large or small intestine.

DISCUSSION

Granville S. Hanes: Cancer constitutes one of the most complex and perplexing problems with which the medical profession has ever had to contend. We know very little more about the subject now than we did fifty or a hundred years ago, except there has been a well recognized improvement in the operative technique in the treatment of cancer, as Dr. Wathen has indicated. I want to say, in compliment to the essayist that he has advanced the most approved of the recent methods devised for dealing with cancer of the colon from an operative standpoint.

There is one feature to which I wish to call attention in regard to the diagnosis. As the essayist, stated, we rely almost exclusively upon the roentgenologic findings in making our diagnosis of cancer of the colon, yet we cannot rely upon that method of examination in making a diagnosis of cancer involving the lower segment of the sigmoid for the reason that the upper segment of the sigmoid when filled with barium will overlie and thus preclude the possibility of discovering a tumor or any constriction that would indicate cancer. I know this to be true because a number of times in my experience I

have seen patients who had been in reputable clinics and had the best roentgenologists make roentgenograms with negative findings, yet it was found later that these patients had cancer of the sigmoid. Possibly by inverting the patient and pouring barium into the sigmoid the question might be more correctly determined in some instances. Where barium is taken by mouth or injected and is all in the pelvic colon, especially if the cancer is situated low in the sigmoid, it is impossible to determine whether or not a cancer is present. Not long since a lady of 30, came to my office for examination. We found she had a lesion in the lower segment of the sigmoid which we were almost certain was a cancer. She later went to another city and had a roentgenogram made. The roentgenologist reported that the lesion in the sigmoid was inflammatory and not malignant. The patient was operated on, there was a recurrence and she died of cancer in less than twelve months.

Another important feature, although it was not mentioned by Dr. Wathen, is that in typical cases of cancer of the colon, especially in the lower left side and sigmoid, is that it is practically useless to operate in young individuals. I heard Mr. Lockhart-Mummery say four years ago that if he had a patient under twenty-eight or thirty with malignancy, especially of the left side including the sigmoid and rectum, he made no attempt to operate with the hope of complete recovery.

Before leaving London I purchased a small monograph written by a layman on "The Cause and Cure of Cancer." It is one of the most interesting books I have ever read. It was really a statistical report collected by the medical profession for the British government. Since Great Britain has in its possession various parts of the world, it has subjects in every climate, subjects in all stages of civilization, from the savage and semi-savage to those representing the peak of civilization. The statistical evidence in the book I have mentioned demonstrated that people who lived the most simple lives, who lived nearest to nature, or nearest the animal as the author expressed it, were seldom known to have cancer. Among semi-civilized people, cancer was infrequent. People living in the highest state of civilization showed the greatest incidence of cancer. The author argues, and I do not know but there may be something in it, that there is an underlying vital cause of cancer that we do not recognize, and it was his conviction that it came chiefly through food. We know there is something very extraordinary about the behavior of cancer in certain cases. Cancer of the rectum and colon in many instances may be detected early so far as our knowledge relates to the age of these tumors and yet when operated by the most skilled surgeons patients have early recurrences and death ensues within a brief period.

The following is another illustration of elusiveness of this problem: A patient in early adult life had lymph-nodes about the neck; roentgen-ray treatment was applied and relief immediately followed. Lymph-nodes then appeared in other parts of the body, which were likewise relieved by the roentgen-ray. The patient was kept alive for fifteen months and then died from cancer. One can scarcely doubt that there was an underlying cause which produced these lymph-nodes and also which produced the cancer and death of the patient.

Last Saturday I saw a lady who was going about and I doubt if anyone would suspect she had cancer. She has had a malignant growth almost five years at the junction of the rectum and sigmoid. I have in the hospital now a man who has had a similar growth less than two years. He can live only a short time. They have as it appears about the same amount of invasion into the surrounding structures. The man will soon die while the woman is apparently in a very good physical state. There may be some fundamental truth in the statement that here is an underlying influence which determines the development and progress of cancer about which we yet know nothing.

J. Garland Sherrill: This is an exceedingly valuable discussion. I have had considerable experience with cancer of the colon and the majority of these patients I have seen came to me for intestinal obstruction, the diagnosis not having been made and the patients not having been seen previously by their physicians. The question arises under such circumstances, what is the best thing to do, whether to perform a temporary operation to relieve the obstruction and then remove the mass later if possible. Occasionally if this plan is followed the patient improves, ceases to apply for treatment, refuses further operation, and fatality eventually ensues. I have seen one woman who was operated upon for acute obstruction during pregnancy. She bore two children afterward and is still living, seven years after operation.

I have also made mistakes in diagnosis of cancer of the colon. In one instance I made the diagnosis of cancer which was removed and proved to be a diverticulitis. One of the first cases of cancer of the colon I ever saw was diagnosed as acute appendicitis. There was a mass in right iliac fossa, pain, tenderness, fever, typical symptoms of large appendiceal abscess such as we encountered in the olden days when the appendix was not operated upon until it had become inflamed. Operation disclosed that the patient had a large abscess postcecal from perforation of cancer of the colon. The difficulty is that we do not recognize the presence of cancer early, as in the majority of instances we do not see the patient until obstruction has developed and the condition is far advanced. It is my experience that the patient does not begin

to show anemia until the case is well advanced. Anemia in cancer is a late and not an early symptom. It is fortunate that constricting cancer narrows the intestinal lumen early in its development. I have seen cases where the lumen of the involved intestine was less than half an inch in diameter. About 10 per cent of the cases of cancer in the region of the cecum are diagnosed as appendicitis.

Strange as it may appear, surgical literature shows that the lymph-nodes in carcinoma of the intestine are not enlarged in the same proportion as they are in sarcoma, which is exactly the reverse of conditions in other parts of the body. I have also found that it is sometimes not easy to make the diagnosis of intestinal cancer by roentgen-ray examination as mentioned by Dr. Hanes. A patient was referred to me recently and upon examination I made the diagnosis of cancer of the intestine based upon the clinical findings. The history showed that the man had been in the city hospital one year previously where a roentgenogram was made. The man who examined and reported on the x-ray plate did not make the diagnosis of cancer. I went to the hospital and read the plate which confirmed my opinion that the lesion was cancer, and operation proved the correctness of my belief. It is not a simple thing to properly interpret the roentgenogram after it is made, it must be read by an expert to determine just what we are dealing with in cases of this kind.

When patients begin complaining of constipation which cannot be relieved by ordinary measures, or when they have symptoms of indigestion, diarrhea and gaseous distension, that is the time to make a thorough physical and roentgenological examination. Later when partial or complete obstruction ensues, the diagnosis can be made by simply looking at the patient's abdomen. The coils of intestine "stand up" showing the presence of obstruction, and in the great majority of cases it is due to malignancy.

Referring to the case reported by Dr. Strickler: I am inclined to believe, from the amount of thickened plastic material around the appendix, that he is dealing with a tuberculous lesion of the appendix. I saw such a case some years ago. The appendix and thickened tissue surrounding it were removed. A tubercular node in the abdomen was subsequently removed thus proving our diagnosis. It was a case similar to the one shown by Dr. Strickler.

Reverting to Dr. Wathen's paper: I cannot see the necessity of using clamps in making an intestinal anastomosis. Simple suture is much simpler and can be completed rapidly and successfully.

J. Duffy Hancock: One of the most interesting features about Dr. Wathen's paper is that it reflects the present-day tendency to place more emphasis on the physiological aspects of this question. Perfect operative technique is a very

beautiful thing, but it means little to the patient whose life is lost because in his pre-operative or post-operative care the physiological side of the question was ignored. The preliminary or preparatory treatment, the operative procedure and the post-operative care are well understood at the present time.

One of the most important points in the preparatory treatment is block transfusions to combat the anemia which is so marked in these cases particularly where the lesion is in the proximal portion of the colon. At present blood transfusions are easy to handle and have proven effective in combatting this symptom.

Preliminary enterostomy or cecostomy not only permits us to drain the intestine and eliminate septic products which generally result from secondary infection but it allows us to divert the fecal current and in that way causes the edema and thickening of the intestinal walls to subside and better healing after operation is secured.

In regard to the post-operative care: Some of the most important features were mentioned by Dr. Wathen, that is ileostomy to relieve gaseous distension and pressure against the suture line, the administration of fluids which are so necessary by some other avenue than the mouth, intestinal tract or rectum. All these methods of administration result in increased peristalsis which we wish to avoid because the principal thing desired is physiological rest at that stage. Fluids can be given satisfactorily, as the essayist said, subcutaneously or by venoclysis as Dr. Hendon mentioned recently before this society.

George A. Hendon: I was very glad to hear the excellent presentation by the essayist and the case report. So far as the technique of the operation for cancer of the cecum is concerned, it seems to me that the climax has been reached and there is little left for us to say about that feature. Of course the technique will differ slightly according to individual preference.

The most important point in the whole proposition is the time at which the diagnosis is made. If we want to reduce our mortality and increase the possibilities of recovery, we must constantly depend more on early diagnosis. In order to do that we must be willing to risk the issue on two or three symptoms. The surgeon who waits for all the symptoms to complete the picture is the one who loses most patients. The only hand that paints a perfect picture of pathology is the hand of death. The only critic that approves that artist is the grave. If a person is fifty years old and has constipation and emaciation rapidly progressive without obvious cause, that individual almost certainly has cancer of the colon.

E. S. Allen: I have enjoyed Dr. Strickler's report and the essayist's paper. I do not know that I can correctly interpret the pathology in the case reported by Dr. Strickler, but it seems to me that the presence of a large amount of

fibrous and connective tissue in the mass would warrant the diagnosis of syphilis even though no spirochaetes can be found. No definite tubercular nodules nor giant cells are present which would exclude tuberculosis, so it looks to me more like a syphilitic lesion than anything else. The pathologist's report showed no definite evidence of malignancy. There is seldom sufficient inflammatory reaction to cause extensive involvement of the intestine from appendicitis alone.

As to cancer of the colon: I reported before this society five cases of cancer of the colon operated on within one year, and have seen another one quite recently. If Dr. Wathen will examine his records more carefully I think he will locate more than twelve such cases operated on within the period of twelve years, because I have had six within a year. I think he has seen as many cases as I have.

The point has been stressed that in cancer of the colon the mortality is very high when patients come to us with acute obstruction. Of the six cases I have had within twelve months, three of them came to me with intestinal obstruction. In four of them malignancy was discovered during operation for another lesion, just as happened in Dr. Strickler's case (when the abdomen was opened). One patient had a large myofibroma of the uterus wedged in the cul-de-sac. Her symptoms were referred entirely to the pelvis, the only thing that suggested cancer was that two months previously she had passed some blood from the rectum. I examined the interior of the rectum and found no pathology there to account for it. So I operated entirely for the uterine tumor. A cancer was found at the junction of the sigmoid and rectum, which was removed by the one-stage procedure. The operation was performed the latter part of August, 1928, and the patient has remained perfectly well. In two cases accurate pre-operative diagnosis was made by Dr. Keith by means of the roentgen-ray after barium enema. If we are going to perform these operations by the two-stage method, I think it is wise to remove the involved intestine at the secondary operation. In cancer of the left side where the Mikulicz operation can be readily used, I believe the mortality will be much less if this procedure is followed. I did a primary resection in all these cases, and fortunately all of them recovered. Four of them are still living. Two died, one eight months and the other three months after operation. In operating for cancer in the left colon or sigmoid, instead of doing a cecostomy or ileostomy, my plan is to thread a colon tube through the anastomosis and fasten it with sutures and cover suture with Lambert stitch. This allows the intestinal tract to drain. I allow my patients to have water by mouth from the first. While I think primarily hypodermoclysis is indicated, particularly if the patient is markedly dehydrated, I can see no reason why

water should not be given by mouth.

D. Y. Keith: In regard to the diagnosis of cancer of the colon by means of the roentgen-ray. Dr. Wathen emphasized the importance of this method of examination. If the patient has almost complete obstruction we can get a very definite idea as to the location of the lesion without using barium. For example, by examining the primary plate of one of Dr. Wathen's cases which I am showing you, marked dilatation of the ileum will be noted which gives an index of where the lesion is. We have found that this is a great aid in diagnosis, because where there is distension of the terminal ileum the lesion is almost always in the cecum. We have seen a few cases in which we gained a fairly definite idea of the location of the lesion in the distal portion of the ascending colon because of marked dilatation. As a rule we do not like to give barium by mouth in these cases on account of the danger of impaction and increase in obstruction. If barium is given by mouth only a small quantity should be used. I have seen cases in which it was very difficult to remove the barium. We occasionally see patients who have been given barium by mouth for x-ray examination and some of the barium has been found in the large intestine many weeks afterward. A man came to the office for examination and in our preliminary fluoroscopic investigation before the ingestion of barium we found a considerable quantity of barium in his colon from a barium meal given six weeks before. He had malignant disease of the descending colon.

In the primary plate which I am showing you there is no barium in the colon and you can see the lesion quite distinctly the proximal ileum being distended with gas. By using the fluoroscope we can get a very definite idea as to the location of the lesion, whether in the descending colon, cecum or sigmoid. In this case no barium was given by mouth, a diagnosis was made by enema. Had we administered barium by mouth it would have been forty-eight hours before it reached the point of obstruction, the barium would have mechanically increased the obstruction and there would have been considerable difficulty in getting rid of the barium after operation. It is entirely unnecessary to invert the patient and "pour the barium into the rectum" as stated by a previous speaker. We use an enema tube and as soon as we have introduced enough barium to show the obstruction in the sigmoid, the enema is discontinued. Elevation of the pelvis is made by use of a motor driven table giving a Trendelenberg position.

Referring to the case mentioned by Dr. Hanes, in which he made the clinical diagnosis of cancer of the sigmoid and the patient went to another city to be examined, recently we saw a patient who had been to two other cities for the purpose of having an x-ray diagnosis made, the report of the roentgenologist in each instance being nega-

tive. We later examined the patient at the request of a Louisville surgeon who had made a diagnosis by rectal examination. He thought by getting the rectum and sigmoid clean and well filled with air, we could get the shadow of the tumor the same as we get the shadow of the heart in the chest. The tumor in this case was not pediculated and could not be visualized by air injection of the colon. By slightly inverting the patient and giving her a barium enema we could easily outline the tumor with the roentgen-ray. I am sure if she had been given barium by mouth we would have overlooked the lesion because of the accumulation of barium and distension of the sigmoid above the point of narrowing allowing it to overlap the tumor. We demonstrated the tumor to our entire satisfaction and made the diagnosis of malignancy of the sigmoid. The diagnosis was proven at operation. There is no difficulty in distinguishing between carcinoma and papillomata, because the latter gives a shadow resembling a bunch of grapes in the colon. The former gives an irregular "rat eaten stricture".

As to retardation of the growth by use of the roentgen-ray: We have found in a number of cases of malignancy of the cecum where complete obstruction was not present, roentgen-ray treatment given over the cecal area caused a very definite reduction in size of the tumor. If these patients would follow our advice and have the growth removed two or three weeks afterward, the surgeon thus attacking the cell "when it is sickest" he would be less likely to "squeeze out" transplants than if x-ray treatment had not been given. After operation the patient should be given another series of roentgen-ray treatment. We recently had a case of this type in which the tumor was so large it could be seen from across the room. The tumor has entirely disappeared under x-ray treatment and the patient afterward refused operation. He has recently visited the Mayo Clinic, who reported negative findings after an x-ray examination of the gastro-intestinal tract. We feel quite sure he will have a recurrence within 12 or 15 months.

Frank P. Strickler: There is one thing I want to mention, and I am glad Dr. Wathen did not include it in his paper, and that is the exclusion operation for malignancy involving the cecum. Several years ago this was a very popular procedure and the patient was allowed to go along without any further surgery being done. As we all know this type of operation simply created a cesspool in the intestine, that fecal matter accumulated in the excluded portion and undergoes decomposition with the production of toxic material, finally ulceration takes place the wall of the intestine is weakened, gas pressure may cause rupture of the intestine with development of general peritonitis and death of the patient. I only mention the exclusion operation to condemn it.

Several authors have called attention to the fact that patients with malignancy of the right colon have a decided reduction in the hemoglobin percentage and a low erythrocyte count, yet these cases are peculiar in that they tolerate operation exceptionally well. In other words in the presence of similar blood findings in any other condition the surgeon would hesitate to operate without first using blood transfusions and improving the physical condition of the patient. It has been demonstrated in the large Clinics that patients with malignancy of the right colon can be operated upon in a large number of cases without serious danger and without resort to the preliminary building up process.

Simrall Anderson: It looks to me like this question of cancer has resolved itself into the "same old seven-and-six"—early diagnosis and early operation removing as much of the cancerous tissue as possible. In the last year and a half I have operated on four patients for cancer of the colon and all of them since have died. One of them lived only three months after operation. Clamps or no clamps it simply means an end-to-end anastomosis with needle and thread removing as much involved tissue as possible.

Unfortunately cancer of the intestinal tract generally attacks the large intestine which is not very susceptible to surgery.

Again, I state that x-ray and radium in cancer of the breast are useless and very harmful, and are only of use in skin cancer and to stop bleeding in cancer of the cervix.

A. David Willmoth: I have listened with much interest to the two papers which have been presented. The case reported by Dr. Strickler is exceptionally interesting. Without further evidence I would be inclined to regard this as a case of syphilis of the intestine. While some of the previous speakers seem to regard it as one of tuberculosis, I think it is more likely to be syphilis. The patient is a negress, and we know that most negroes are syphilitic. I have encountered syphilis of the intestine in quite a number of instances. One of the most decided cases of intestinal lues I ever saw involved the first twelve inches of the jejunum. There was a large mass with much thickening of the intestine which I did not attempt to remove because it was discovered incidentally during operation for another intra-abdominal lesion. The man died within a short time after operation. It was afterward ascertained that he had syphilis for which he had received no treatment.

In regard to malignancy of the intestine: Some of the speakers mentioned early diagnosis and early operation. These are very important, of course, but how are you going to make a diagnosis early when the patient himself does not know he has the disease and does not consult you until he is in trouble? My experience with intestinal cancer is that the patient does not consult his physician until the lesion is far ad-

vanced. In both males and females, where there is malignancy of the small intestine, the patients do not consult us until obstruction occurs. They may have previously had some disturbances of the intestinal tract, but this is so common, especially in women, that they pay little or no heed to it. When the intestinal lumen becomes obstructed the patients come to us complaining of a tumor. Constipation is generally absolute. The same statements will apply in slightly lesser degree to malignancy of the large intestine.

It is an ancient axiom that "the older the patient the slower the growth, the younger the patient the more rapid the growth" in any type of malignancy. This is due to the fact that in young subjects the lymphatic system is exceedingly active and there is greater tendency for the growth to enlarge and become disseminated, whereas in elderly people the lymphatic system is inactive and there is consequently less tendency for the cancer to spread.

As to the type of cancer: A few years ago McCarty called attention to the fact that it depends entirely on the type of cancer as to what is going to happen to the patient. If the growth is very malignant in type, which we will designate as group four, there is nothing that will do the patient any good, he is doomed from the start. It makes no difference how small the tumor is when first seen, there is no operation, roentgen-ray therapy or anything else that is going to influence the growth of that tumor, it will continue to progress and cause death of the patient. In some of the less malignant types, which we will call groups three and two, there is some chance of relief by the application of proper remedial measures provided the patient is seen early enough. In the remaining type, which is designated as group one, the growths are very amenable to treatment and may be permanently cured by the application of surgery, roentgen-ray therapy, or radium, the effect of the latter two being identical.

In the ascending colon, if the patient is in reasonably good condition, I have always believed primary resection and anastomosis can be easily performed with comparative safety to the patient, the operation being completed in one-stage. On the left side it is an entirely different proposition. Here we often have to operate in an emergency to save life and the one-stage procedure is out of the question because of distention and obstruction. In such cases I have always followed the advice of Finsterer and performed a two-or-three-stage operation.

With reference to the Mikulicz operation: I condemn the procedure on account of the likelihood of metastasis in the abdominal wall. I happened to be present in the Mayo Clinic when Dr. Charles H. Mayo did some of his first work in bringing the intestinal loops through the incision like a double-barreled shotgun which seemed at the time quite an ideal procedure. Shortly af-

ter returning to Louisville I had occasion to operate on two patients for cancer of the descending colon and employed the Mikulicz procedure. Both patients afterward developed decided metastasis in the abdominal wall and went the way of all flesh. Since then I am free to say that I have not been so keen about the Mikulicz operation. I prefer making an anastomosis primarily and then removing the tumor and involved portion of the colon at a later date.

In dealing with cancer in any situation the minimum amount of manipulation should be used. In other words, if you want to make a cancer grow and rapidly disseminate, handle it, that is all that is necessary. You might as well not operate on the patient. Handley in his book on cancer of the breast calls attention to a series of cases in which six medical students were delegated to examine the patients with cancer of the breast, they were asked to palpate the tumors lightly. All the cases were tabulated and the patients closely observed. All of them died within a short time from rapid dissemination of cancer.

In regard to roentgen-ray treatment: I was particularly interested in Dr. Keith's remarks concerning x-ray therapy in right-sided colonic cancer. No one can foretell whether the results secured will be temporary or permanent. In a malady like cancer anything and everything should be tried. We must influence the patient in every possible way, and I was glad to hear Dr. Keith say that in these cases the x-ray should be used both before and after operation. We may be dealing with one of the lower types of malignancy that is distinctly susceptible to the roentgen-ray, but if this be not true the patient certainly should not be deprived of any measure that gives any promise of influencing the disease in a favorable way. I believe the patient should be changed in so far as his modes of life are concerned. So long as we are dealing with that unknown quantity—cancer—and so long as nobody knows its cause, whether it be due to a parasite, micro-organism, or chemical change in the body tissues it matters not, we must employ every known means to improve the condition of the patient, because it must be true that the patient with cancer either has something in his system he should not have, or should have something in his system that he has not. Since it seems to be true that mechanical, chemical or bacterial irritation starts the lawless growth of body cells, is it not perfectly logical to believe that by changing the chemistry of the patient's system may have some influence on the process? Take an individual who has lived for thirty years eating the same kinds of food every day. If he has one cancer, and his underlying systemic condition remains unchanged, is it not quite likely that another one may occur? Dr. Hanes alluded to this feature when he said that cancer is not prevalent among savage and semi-civilized

people; but as we approach the higher types of civilization, with the changed modes of living, etc., there seems to be a distinct predisposition to cancer in various parts of the body. It is true that certain animals and reptiles are subject to cancer, it is an entirely different growth from that which occurs in the human-being.

Everything possible should be done for the cancer patient to increase his vital resistance. As remedial measures we must use the ultra-violet light, the roentgen-ray, radium or surgery, which ever may be deemed best with an adequate understanding of the lesion with which we are dealing, and lastly constant observation of the patient. My own experience has been more or less unsatisfactory in that it has not always been possible to keep these patients under observation. The patient may appear at seven o'clock in the morning with a tumor which has been diagnosed as malignant, and thinks he can be operated upon and leave for home at twelve o'clock the same day. He does not realize the gravity of the situation and sometimes cannot be influenced in the least. When the time arrives that we can get our cancer patients to co-operate in the same sense that tuberculous patients co-operate today, we will be able to accomplish much more good in treating cancer, not so much perhaps in cancer as in tuberculosis, because the latter are already willing to co-operate. Many cancer patients could be controlled if we could get the same degree of co-operation that we can in patients who have tuberculosis. When that time arrives we will have a better chance of successfully dealing with malignancy.

Virgil E. Simpson: The scope of Dr. Wathen's paper has broadened so much that finally an internist may venture in. As I was listening to the discussion on the subject of malignancy, I began to run over in my mind the number of doctors in Louisville who have died in the past three years of malignancy of the digestive tract. The situation is alarming, but I was very much comforted by the suggestion of one of the speakers that the incidence of cancer increased with culture; for once we doctors are properly catalogued. There have been nine deaths from malignancy of the digestive tract among Louisville physicians during the last three years. It seems to me that this is a percentage of incidence of malignancy of the digestive tract that is probably not approached in an equal number of people in any other walk of life.

The only other point about which I wish to speak is with reference to the diagnosis of cancer. It has been stressed that the earlier the diagnosis the greater the prospect of relief to the patient, therefore anything that may shed light on questionable cases from a diagnostic standpoint should be welcomed. The sugar tolerance test is accredited with having some value. The procedure is first to determine the blood sugar level of the individual fasting and

the blood sugar levels after glucose administration. Blood is drawn at intervals of one, two, three and four hours. The fasting blood will show a sugar level of approximately 100 in a normal individual. Fasting blood from an individual with a malignant growth would probably show 120 or more. This has been found true in a sufficiently large number of cases to make the procedure worth while. $1\frac{1}{2}$ grams of glucose is given for every kilo of body weight. In the normal individual it will probably show 160 in the second hour, 120 in the third hour and perhaps 100 in the fourth hour, or it may be even lower than at the beginning. That constitutes what we term the normal sugar tolerance curve, the characteristic feature being that there is a rapid rise and a rather rapid descent; whereas in a case of malignancy the sugar tolerance test will show a rapid rise at the start, it will rise higher in the first hour, it remains higher at the end of the second hour, and continues at a higher level during the period of study, showing a curve that differs widely from that of a healthy individual. It is a curve that ranges between that of a normal individual and a true diabetic.

This procedure has been done sufficiently often to find it is of some value from a diagnostic standpoint in malignancy of the digestive tract.

PREVENTION OF TUBERCULOSIS BY PUBLIC HEALTH METHODS AND THE SCIENCE OF MEDICINE*

By H. P. SIGHTS, Paducah.

In presenting this subject for discussion, I am advancing nothing new in the prevention of tuberculosis for myself, or anything that has been discovered and described by students and investigators of this disease; nor shall I attempt to recite all of the theories advanced in the past history of a disease due to this minute microscopical organism that has caused and unlimited expenditure of money and years of untold research by the Medical World; a disease, the treatment of which as recognized, is so simple every intelligent layman can glibly recite the formula—sunshine, rest, pure air and food—and as some writer has stated “Centuries ago a shrewd practitioner advised a young man suffering from tuberculosis to get him a cow and go up into the mountains.” This sums up about all the wisdom of the modern tubercular therapy even to this date.

This being in a degree true, the difficulty presenting itself to the Public Health Department and all others seeking to prevent its spread and control of the infection, seems an unsurmountable problem that as yet is unsolved. As proof of this statement I will present the following statistics:

*Read before the McCracken County Medical Society.

In the Continental United States, the 1925 statistical reports show the total deaths from tuberculosis to be 89,268, a percentage of 86.6 per 100,000. In 1926, the total deaths from tuberculosis to be 91,568, a percentage of 87.1 per 100,000, an increase of .5 per cent.

The tabulation made by the writer of comparative periods of ten weeks of 1927, and 1928, January, February and two weeks in March are as follows: Three of the leading cities of the United States, namely: New York, Chicago and Philadelphia:

1927	
New York.....	995
Chicago	470
Philadelphia	313

Total 1927.....1778

1928	
New York.....	1696
Chicago	495
Philadelphia	302

Total 1928.....1893

An increase in deaths of 115, being out of proportion to increase in population. Other statistics given by different writers show some years or periods of years a decrease in deaths and other periods an increase.

It is very conclusive that very little has been accomplished in the efforts of the different organizations in reducing the percentage of deaths, as one writer, Dr. Maurice Fishberg, has stated that it costs the country five hundred millions of dollars annually and around one hundred thousand lives. On this basis a crusade is now on to prevent infection with tuberculosis that will cost millions of dollars. Will it be successful? We hope earnestly that it will, but skeptically speaking, I really think that it will be barren of results, unless there is some newly discovered line of defense used.

Dr. Goldberg, of Chicago, states not later than March 13, of this year that tuberculosis in children had increased.

It is necessary to consider something of the conduct of the tubercular bacillus and how it enters the body. Dr. James A. Britton, of Chicago, states in an article published in the Kentucky State Medical Journal, January number, that pulmonary tuberculosis was a disease of the lungs, due to an infection of the body in childhood by tubercular bacilli, but not usually manifested until adult life. This theory is not so generally accepted. Others contend the portal of entry is by the respiratory channel only. Others contend that it is through the digestive system and then through the glands and lymph channels.

In the conduct of the tubercular bacillus we must consider also the biology of the bacillus as being worth while in the crusade against

its infection and spread. In considering prevention, it is necessary to have some estimate of its resistance in individuals and race tendencies, age and physical defect, also hereditary tendencies as some call it, in the study of tuberculosis. The many factors, medical, sanitary, sociological, economical, education and legal have been entered into in the presentation by different students on the control of tuberculosis. First, the study of the bacillus, its conduct in the human body, its types, biology and its resistance against destruction and death. It is understood to be non motile aerobic and facultative anaerobic organism; a strict parasite, not having a habitant outside of the body of man or animal. It requires a temperature about that of the human blood. There is nothing in nature outside the human or animal body that it exists in. It is not definitely known that it multiplies by spore formation. Its resistance against destructive agents varies. It is not necessary in this discussion to present the various resistance to chemicals; but its resistance to sunlight and moisture fits the purpose of this discussion. Theobald Smith has shown that when suspended in distilled water, normal salt solution, milk or bouillon, with even heating, the bacilli are killed from 15 to 20 minutes at 60 degrees C. The majority are killed in from 5 to 10 minutes, but if dry they can survive a temperature of 100 C for one hour, but if moist are killed at 70 C in one hour. Cold has practically no destructive effect on the bacillus. Diffuse sunlight rapidly kills. Jousset found that tubercular sputum was sterilized after forty-eight hours. Direct sunlight destroys them in seven hours. Doch's observation was that direct sunlight killed them in a few minutes to one hour, according to thickness of layers of sputum. Schill and Fisher state however, if quickly dried, sputum retains its virulence for four months. Twitchell found that sputum kept on a handkerchief, a woollen blanket and on wood at a room temperature produced lesions in a guinea pig after several days. Many experiments are similar. Therefore, it is shown that tubercular bacillus is not as rapidly destroyed by decomposition as other pathogenic germs.

The chemical composition of the tubercular bacillus I will not undertake to report but suffice to say that the bacillus contains disproportionate elements found in the human and animal body. The deduction that can be made from these facts is that the tubercular bacillus originates in the human body and preferably the lungs and lymphatic glands as the most favorable tissues.

Another deduction is that sunlight and air presents the most favorable preventative and curative agents as natural elements.

When we consider it primarily a local disease, the infection under natural circumstances depends on its mode of entrance and disposition in the tissues. However, it is conceded that the main portal by which it gains entrance is through the respiratory system. If the glandular system is considered one of its portals of entrance, then the digestive system is just as liable to be equally an avenue of entrance. But, facing the nasty little fact that it only exists in man and animal and does not thrive outside of those hosts, upsets the apparently well fortified theory that caution and sanitary hygiene and isolation will stamp it out. As stated early in this paper the quotation from Dr. James A. Britton, of Chicago, that the bacillus lies dormant from childhood in the glands or somewhere, is another difficult assumption to explain.

Therefore, it is a disease that invites the attention of the social reformers. It is so wide spread that there can hardly exist a family in which some instance of its ravages has not occurred. Its infective origin is supposed to be well known, so that theoretically it should be capable of extinction, being for the most part a chronic disease. Its extinction would be a great saving to the community, but though the reduction in mortality claimed has been lessening in the last fifty years but still remains high, as shown by the state statistics, in spite of the concentrated efforts of international, state, and many societies in the last thirty years.

It is possible that in the campaign against tuberculosis the advocates of a particular measure have forgotten certain facts in its history. In the first place the mortality from the disease began to decrease long before the campaign was thought of, even before the cause of the disease was known. The question is, was this deduction in mortality due to acquired immunity, change in character of the disease or to better habits and conditions of life. The answer to this is of great importance, especially to the statesmen called on to decide whether he shall spend the states money on the elimination of the disease.

Secondly, the bacillus of tuberculosis is ubiquitous in all civilized communities and it is agreed that most of us at one time or other have been infected.

Thirdly, failure to remember the two previous facts has led to confusion between prevention and cure in the aims of the various societies engaged in anti-tubercular campaigns. It is evident that from investigation tuberculosis is not linked up with houses or flats. It is linked up with foci of the disease.

A. K. Krause believes that there are a number of factors that go into the making of the tubercle. There are micro-organisms, tubercle bacilli, which, for reasons thoroughly

unknown to us, can live and multiply in the bodies of certain animals, of which man is one. These micro-organisms are sluggish in development, but hardy of constitution and tenacious of life. Their hardihood and their resistance to outside agencies are undoubtedly the consequence of their possession of an extraordinarily high constitutional content of lipid substances, of which a very refractory wax (or waxes) is in greatest abundance. They are also endowed with protein (or proteins) combined peculiarly, no doubt, with their wax. When living they settle in the body for the first time, the tissues react to their presence by forming nodular tubercle. The tissues form nodular tubercle because they react in this way to the lipoids of the bacilli. Nodular tubercle is their native method of dealing with those refractory substances, so called foreign bodies, which they cannot dispose of by direct disintegration and dissolution. Nodular tubercle, at bottom, is therefore a protective and consecutive process, serving to wall off tubercle bacilli and set them apart from normal tissues. In by far the greatest number of tuberculous infections, the ninety per cent and more which never became active clinically, nodular tubercle performs this defensive function successfully, as it keeps in confinement tubercle bacilli and the other deleterious products of its interior, (such as degraded proteins of component cells).

While the state and national legislation in public health is considered the rampart in the defense against infection of tuberculosis, it has proven of very little benefit in its control and spread. Most every state has on its statute books regulations in its prevention. Scarcely any are enforced. Municipal regulations are disregarded. Health organization local and national appeal in vain for protection of the public. The power of the press with its educational presentation of the danger; its columns open to all anti-tubercular propaganda, seems of little avail. Administrative rules and regulations are disregarded. The health laws in some states demand that records of reports shall be kept by local health officers and not divulged so as to disclose the identity of the persons to whom they relate. Yet the law is changed and personal rights are adhered to and the fight against the unseen foe of humanity is a losing one, and it continues to strike in the dark without warning, choosing the victim without regard to class or station.

It seems that public opinion must change and a more thorough understanding of the plan of attack should be understood, bringing a different attitude towards the prevention of its invasion. The hereditary question in its prevention; the housing elements in

spreading its infection; family relation; social contact, marriage and public contamination, all have been discussed and many differences advanced among the scientific investigators.

The result of all this has been a demand that we recast our views on the prevention of the disease. There are obviously many avenues and modes of infection and many channels of entry into the system; lowered vitality from various causes, disease tends to light up the infection already existing in the body.

It would hardly be right not to take notice of Maurice Fishburg's statement in a recent article in the *American Mercury*. "A Nasty Little Fact"—that at times upsets a seemingly well fortified theory. Sometime ago workers of scientific equipment began to re-examine the knowledge we possess about tuberculosis and soon they discovered that while we have exact information about the agent causing infection, we lack any knowledge about the factors operative in causing the disease in a person after having been infected." Others working along statistical lines have found to their utter amazement that the many angles in the conduct of this dreadful disease have presented some difficulties that the old line of defense against its spread and prevention was upset, and the World's War convinced us that army life weeds out the less resisting constitutions, building up the red blooded fellows whose descendants may be constitutionally immuned against this strong and unrelenting foe, whose prevention is almost as impossible as immorality and crime.

If true as stated by some that tuberculosis has its beginning in childhood by hiding in seclusion in the lymphatic glands and other tissues; if immunity is conferred by light attacks and hereditary transmissions, the treatment and prevention as recognized should undergo some alteration.

Louis Corbett of Cambridge, England, expressed himself as follows: "At the same time it would appear that great care must be taken lest things be made worse instead of better. For if this immunization by means of small doses of widely distributed bacilli is playing an important part in increasing the resistance of the present generation, it is possible that by checking the distribution of the bacilli, as for example, by discouraging spitting or by abolishing bovine tuberculosis from dairy cattle, we may actually be undermining the resistance of the race and paving the way for future increasing severity of the disease. Edward R. Baldwin, one of the highest authorities on tuberculosis in this country, says. "Adults are very little endangered by close contact with open tuberculosis and not at all by ordinary association. It is time for a reaction against the extreme ideas of infection

now prevailing. There has been too much read into the popular literature by health books and in lecture that has no sound basis in fact and it needs to be dropped out or revised." (Read *Mercury* page 132).

What are the medical profession, the law makers, public health authorities, going to do about it? Can they establish preventoriums instead of sanitariums and build up the non resisting and immunizing the feeble and susceptible ones?

Two such institutions exist. Dr. Richie for adults. Dr. Granche for children. In addition to this the increasing of parks and playgrounds in congested centers will help build up defensive constitutions, and since the Government has appointed commissions, local Congress has been held; local societies formed, national associations exist everywhere and international congress meets triannually, a permanent national bureau exists. In addition to to all of these a universal enthusiasm has been aroused, yet, confusion and uncertainty exist.

And as some one has written, the arch enemy of mankind still winds its insidious way through the ranks of humanity carrying death and destruction on its wings.

It is maiming our little children and blighting the hopes of those on the threshold of success. It spares neither young nor old, rich or poor, but travels on and on—through every highway and by way and in every land and clime—feeding on living flesh, massing its cohorts within our very tissues and making us an unwilling ally to slay our loved ones.

FIERCER THAN WAR, MORE TERRIBLE THAN FAMINE—IS THE TUBERCLE BACILLUS!

DISCUSSION

J. N. Bailey: I want to congratulate the essayist on the preparation and presentation of these papers. They are the result of much study, experience and good judgment. In the main I agree with them. It is discouraging to see how little we really know about tuberculosis, notwithstanding the fact that so many years, so much effort and so many millions of dollars have been spent on its prevention, diagnosis and cure.

The thoughts presented by Dr. Sights, if proven true, upset much of our previous teaching. We do know that the T. B. bacillus is the cause of tuberculosis. We do know that the animal host is the only place that the T. B. bacillus will thrive and multiply, and we are able to recognize the lesions produced by this bacillus at post-mortem, but it is more difficult to recognize in the lung. We do not know just what there is in one individual and not in another that permits the growth of this bacillus in one and prevents it in another, or why one person develops an immunity and the other does not, or why one individual resist a large dose of bacillus or a continuous exposure to the infection and an-

other person will succumb to comparatively a small dose or a slight exposure.

I don't believe the *T. B.* bacillus develops in animals or man without receiving the initial infection somewhere sometime, any more than I believe wheat would grow in soil without the first seed. I do believe that there can be built up a natural immunity to this disease, and I do believe that the improper endocrine balance and the incorrect amount of vitamins does help to produce suitable soil in which the *T. B.* grows more readily.

As to the diagnosis and treatment, any school child can recite the treatment but the early diagnosis is not easy, because we are dealing with a lesion that is covered by the chest wall and presents many characteristics and symptoms, but each physician must develop his technic and interpretation of finding.

I like the outline of examination and symptoms as presented by Dr. Willingham.

Early Diagnosis and Prevention of Carcinoma of Cervix.—Of 669 cases of carcinoma of the cervix reported by Pemberton and Smith, 2.39 per cent were diagnosed on the basis of microscopic examination, the gross observations being inadequate for a diagnosis. They feel that there should be no hesitation about excision of cervical specimens for biopsy. In this series no harm is known to have come to a patient from the procedure, and it was a life-saving measure in ten of the sixteen cases of early cervical carcinoma. The other cases of early cervical carcinoma. The other six carcinomas were found by routine microscopic examination of trachelorrhaphy specimens. That only five out of 3,814 patients on whom trachelorrhaphy was performed, none of 1,408 whose cervixes were cauterized, and none of 740 whose cervixes were amputated are known to have developed carcinoma, suggests that treatment of diseased cervixes may be a prophylactic measure as regards the incidence of cancer. That only twelve out of 669 patients with carcinoma of the cervix had had trachelorrhaphy and that none had had cauterization or amputation also suggests the prophylactic value of careful cervical treatment. Long continued observation of patients whose cervical specimens were microscopically suggestive failed to disclose the development of carcinoma in any instance. Although in the very rare case it cannot be decided microscopically whether or not cancer is present, in the majority of cases the decision may be made quite definitely.

"ENCEPHALITIS FOLLOWING MEASLES"*

By JAMES W. BRUCE, M. D., Louisville.

"It has been recognized for a long time that the various acute infections, e. g., measles, scarlet fever, pneumonia, pertussis, etc., may be followed by encephalitis." (1) While a few instances of encephalitis are seen following various other acute infectious diseases, by far the largest number are associated with measles.

The clinical picture is of a highly variable character. The onset is usually sudden and develops during or a few days after the attack of measles. Fever and headache are frequent symptoms. Convulsions have occurred in many cases. The most striking of all the symptoms is the change in the mental condition, varying from mild irritability or apathy to profound stupor or delirium. Some form of paralysis is frequently present.

The physical signs are chiefly those due to varying degrees of meningeal irritation or increased intracranial pressure. Stiffness of the neck, Kernig's sign, Brudzinski's sign, bulging fontanelle, or positive McEwen are noted in a fair proportion of cases. The condition of the reflexes is highly variable. Ocular symptoms although rare are striking when present. Blindness may occur. Fixed dilatation of the pupils may be present. Nystagmus and strabismus may be found.

Spinal fluids usually come away under increased pressure and are nearly always clear. There is generally a slight increase in cells, which are mostly mononuclears, and also a slight increase in globulin. Sugar is uniformly normal or high. Smears and cultures are uniformly negative for organisms.

It is obvious that all forms of encephalitis present more or less similar clinical pictures. The diagnosis of cases associated with measles is based almost exclusively on the manifestation of encephalitis occurring during or shortly after an attack of measles. Indeed there is nothing in the clinical picture above to exclude definitely epidemic encephalitis. It may be noted, however, that the onset is more sudden and the duration is shorter than is usually the case in epidemic encephalitis.

CASE REPORT

Patient seen through the courtesy of Dr. Frank Fleischaker.

J. G., aged 10 years, is an only child. His parents are living and well. He has been subject to attacks of asthma since he was 18 months old. He had pneumonia at 8 years.

In February, 1928, he had a fairly severe attack of measles. Temperature receded and rash faded in the usual manner and he was

*Read before the Jefferson County Medical Society.

considered to be well on the road to recovery. After one or two days of normal temperature his mother noticed he was drowsy and did not pay attention to his surroundings. He dragged his feet when he walked. In the course of three days this drowsiness had developed into a stupor from which he could not be aroused. He cried when anyone attempted to handle him or talk to him, but he would not or could not speak. He lay quietly in bed most of the time, remaining in one position unless moved. Temperature was normal. Bladder and rectal evacuations were involuntary.

Physical examination revealed a poorly nourished but fairly well developed boy of 10 years. Nothing abnormal was noted about the skin, abdomen, heart, lungs, mouth, throat, or ears. The neck was not rigid. The arms and legs seemed stiff as if the muscles were in a state of partial contraction. The knee jerks were active and equal, but not exaggerated. All other reflexes were normal. Pupils showed no irregularity or sluggishness. No clonus, Babinski, or Oppenheim. Ophthalmoscopic examination showed no choked disk.

Spinal puncture showed a clear fluid under no increase of pressure. There were 10 cells and no increase in globulin. Sugar was 90 mg. per 100 c. c. fluid. Wassermann on spinal fluid was negative.

The history of onset of stupor following measles, the absence of focal neurological signs, absence of choked disk, and negative spinal fluid made the diagnosis of encephalitis most probable.

Treatment was instituted with the object of maintaining the child's nutrition in the best possible state. Since he would not eat, it was necessary to feed him through a nasal tube. This was done four times a day and a mixture of milk, raw eggs, cereal, green vegetables, cod liver oil, orange juice and beef juice was divided into four feedings. The diet yielded about 2000 calories. Constipation was controlled by enemas and laxatives.

The case progressed uneventfully for about two weeks with no change except that the patient seemed to be slowly losing ground. He seemed to be in a stupor, yet his eyes were open most of the time. Noises or talking made him cry. He could not or would not make response of any kind to questions. About this time it was noticed that his legs which he kept constantly flexed on his thighs could not be straightened. Consultation was had with Dr. Barnett Owen, who advised straightening the legs under general anesthesia and application of a plaster cast. He was transferred to the Jewish Hospital, where this procedure was carried out, the cast being applied from the ensiform to the toes.

For two weeks he lay in the cast. By the end of that time his mind had cleared suffi-

ciently for him to carry on a conversation. The cast was then removed and he began to take food in the normal manner.

Strength returned slowly. As the mental condition cleared, irritability and sleeplessness took place of stupor and for days and nights at a time he apparently did not sleep at all in spite of large doses of sedatives. This condition also improved with time.

He entered school this past September and is apparently perfectly well, mentally and physically.

REFERENCE

- (1) Bulletin N. Y. Academy of Medicine. Vol. III., No. 6. June, 1927, page 414.

DISCUSSION

William E. Gardner: I want to express my appreciation of Dr. Bruce's report. He has described an apparently typical case of encephalitis in which there were no neurological symptoms except contracture of the legs. We know that the symptoms of any type of encephalitis, whether it be true encephalitis, whether following influenza or any other infectious disease, are very similar in the acute stage. Dr. Bruce's description of his case would lead us to believe that it was undoubtedly one of acute encephalitis following a severe attack of measles. The only abnormal feature about the spinal fluid was the sugar content. I believe 90 mgm. of sugar per 100 c. c. of fluid is rather high. There is some increase in spinal fluid sugar in most cases of encephalitis and poliomyelitis, but we know increased intracranial pressure from any cause will produce the same phenomenon. Sometimes a considerable period must elapse before true encephalitis lethargica can be excluded. Many cases of encephalitis of short duration have been reported, followed by complete recovery without later sequelae. In other apparently similar cases, after two or three years characteristic sequelae have developed. The former were probably cases of simple encephalitis, the latter encephalitis lethargica. In Dr. Bruce's case one would not expect any sequelae, as I believe it was one of those types of encephalitis following acute infectious disease, and perhaps not one of true encephalitis lethargica.

NEWS ITEMS

Dr. Frank M. Stites, Louisville, announces the removal of his office to Suite 804 Francis building, after May 10th, 1929. Telephone City 639.

Creatine and Creatinine in the Urine of Children.—In fifty-three normal children and in eighty-seven children with various diseases, the excretion values for creatine bodies were determined. In tuberculosis the values always increase, especially in the presence of fever. If the condition continues serious for some time, the values tend to decrease while the rate per body weight tends to increase.

WOMAN'S AUXILIARY NOTES

WOMAN'S AUXILIARY, TAYLOR COUNTY MEDICAL SOCIETY MEETS

The Woman's Auxiliary of the Taylor County Branch of the Kentucky Medical Association, met Friday afternoon, March 22nd, 1929, in the new parlor of the Corner Drug Store, with eleven present.

Through the untiring efforts of the president, Mrs. W. B. Atkinson, and the secretary, Mrs. J. P. Gozder, this organization has grown from seven to seventeen members, and has emerged from its embryonic stage into a live organization, ready to help in all welfare work and to foster a closer bond of friendliness between the wives, daughters and sisters of the doctors of the county, that they may encourage especially the schools in putting on health programs.

Mrs. Atkinson brought before the Auxiliary plans for a clinic which the Parent-Teachers' Association wishes to put on in April, to give the children of the town and county a thorough medical examination, and in which the Auxiliary was asked to co-operate. The following committee was appointed to confer with the Parent-Teachers' Association; Mrs. Mary Hayes, chairman; Mrs. Scott Buchanan and Mrs. Burr Bowen. It was decided to call this clinic "THE JANE TODD CRAWFORD CLINIC," as a tribute to the brave woman who rode so many miles on horse-back to Danville to allow Dr. Ephraim McDowell to try upon her the operation that was to make him famous, and to be a boon to generations of women yet unborn.

Mrs. Atkinson read Mr. Hoover's letter asking that May 1st be observed as Child Health Day, and his creed of the right of every child to be well born and to be educated mentally and morally. A program for this day will be decided upon later.

President—Mrs. C. V. Hiestand.

First Vice-President—Mrs. Joe Callison.

Second Vice-President—Mrs. W. B. Atkinson.

Secretary and Treasurer—Mrs. J. P. Gozder.

Parliamentarian—Mrs. Merlin Wood.

Historian—Mrs. J. S. White.

Delicious refreshments were served by Mr. Carl Carer and his capable assistants, who had extended the hospitality of their beautifully decorated new ice cream parlor, all gay for the occasion, in spring flowers and ferns, to the Auxiliary. After a vote of thanks to the Corner Drug Store, the Auxiliary adjourned to meet in June.

JANE TODD CRAWFORD MEMORIAL FUND INCREASING

Contributions to the Jane Todd Crawford Memorial Fund are being received daily by the Treasurer. The total is now \$81.10. Anyone desiring to contribute, may send check to Mrs. W. G. Salisbury, Puritan Apartments, Louisville.

BOOK REVIEWS

SURGICAL DIAGNOSIS IN TABULAR OUTLINE—By Dr. A. J. Cemach, Vienna, Austria. Authorized translation, with additions and notes, by Edward L. Bortz, M. D., Associate in Medicine, The Lankenau Hospital, Philadelphia; Assistant Instructor in Pathology, Medical School, University of Pennsylvania. F. A. Davis Company, Publishers, Philadelphia, Pa. Price \$12.00 net.

Surgical Diagnosis as presented in this work is not a text-book but is distinctly a reference book for the student and practicing physician. It gives in concise form the salient diagnostic and differential points in typical cases of the familiar as well as the less common conditions the surgeon is apt to encounter.

With its many plates and charts, it should prove of great service to the student and more especially to the busy general practitioner, who oftentimes is pressed for time in studying up a case and who in this volume will find the information he desires conveniently arranged.

HISTORY OF MEDICINE, with Medical Chronology, suggestions for study and bibliographic data by Fielding H. Garrison, M. D., Lieut.-Colonel, Medical Corps, U. S. Army, Surgeon-General's Office, Washington, D. C. Fourth Edition, Revised and Enlarged. Octavo of 996 pages, with 286 portraits and other illustrations. W. B. Saunders Company, Philadelphia and London, 1929. Cloth, \$12.00 net.

Dr. Garrison has just revised his book. In the New (4th) Edition he reviews all the important advances in our knowledge. Many new sketches of men, places, and events are given. There is a new chapter on medicine in prehistoric times. He reviews recent medicine in Soviet Russia, Italy, Spain and the Latin American countries.

Every fact, every change in our knowledge, every important step in medical history has been examined, weighed, and if noteworthy, included in the New (4th) Edition. The valuable chronology of public hygiene and medicine has been greatly increased. So numerous and widely distributed were these additions that it was necessary to reset the entire book—now nearly 1000 pages.

The Journal of the American Medical Association says this of Dr. Garrison's History of Medicine: "Compact and crowded with facts, but pleasant reading throughout; clear and concise, rich in happy phrases, apt quotations, with occasional flashes of humor and many historical and cultural allusions.

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COUNTY SOCIETY REPORTS

Fayette: In the death of Dr. Arthur S. Loevenhart, an honored and useful member of the medical profession, we the members of the Fayette County Medical Society, feel that our profession has sustained a very great loss.

By his untiring energy and devotion to his profession he has left a rich heritage to humanity in the work he accomplished. A man's life is not measured by his calender years, but in the deeds with which he has filled those years, and when measured by this standard, Dr. Loevenhart's life was rich indeed.

While we sorrow with his family and friends in his going, we are not ungrateful or unappreciative of the rich heritage he has left to posterity and acknowledge our selves enriched by his contributions to his chosen profession.

Be it resolved, that these resolutions be spread upon the minutes of the Fayette County Medical Society, a copy sent to his family, to the daily papers, and the Kentucky State Medical Journal.

J. A. STUCKY,
JOHN W. SCOTT,
ERNEST W. BRADLEY.

Franklin: The regular monthly meeting of the Society was held in the Writing Room of the Capital Hotel, Thursday, April 4th, 1929.

Members present were: Drs. A. M. Lyon, R. B. Ginn, John Patterson, C. E. Youmans, R. M. Coblin and L. T. Minish.

The Society was called to order by the President, Dr. John Patterson.

Minutes of the March meeting were read and approved.

The essayist for the meeting, Dr. C. K. Wallace, was not present, he having been called out of the city. The program was turned into clinical case reports, and interesting cases were reported by Drs. John Patterson, R. M. Coblin and F. M. Travis, all brought out much interesting discussion, which was participated in by everyone present, after which the Society adjourned to the Hotel Dining Room for lunch.

L. T. MINISH, Secretary.

Carlisle: The Carisle County Medical Society met in regular session in the Hotel Victor at Arlington, with the President, Dr. Galloway, in the chair.

After divine invocation by Dr. Hocker, the regular program was taken up.

J. F. Dunn read a very interesting paper on "Diagnosis and Treatment of Diseases of the Accessory Sinuses of the Nose." This paper was for the general practitioners benefit and all took part in the discussion.

E. E. Smith read a good paper on "Headache," giving six classifications as etiological factors.

This paper was thoroughly discussed by all present.

G. W. Payne gave a talk on "Fractures of the Forearm," illustrated with x-ray pictures of the various fractures.

GEO. W. PAYNE, Secretary.

Scott: The Scott County Medical Society was delightfully entertained by Dr. Wm. Mason, at Stamping Ground, Kentucky, May 2nd, with a five course dinner, prepared and served by Mrs. J. H. Northcutt, who understands thoroughly how to prepare and serve excellent dinners. After dinner we retired to Dr. Mason's office, where the minutes of the previous meeting, were read and approved.

The following officers, visitors and members were present: Dr. A. T. McCormack, Secretary State Board of Health; J. W. Baird, President; H. V. Johnson, E. A. Anderson, S. S. Amerson, L. F. Heath, W. S. Allphin, M. D. Sanford, P. H. Crutchfield, Wm. Mason and A. Stewart, members.

This society is very grateful and feels highly honored at having had our distinguished Secretary of State Board of Health, Dr. A. T. McCormack, come to us to better inform us on

measles and other diseases of importance. He clearly demonstrated that his interest is for the doctors and public in preventative medicine.

After which a general discussion. No further business, a vote of thanks was made for Dr. Mason's excellent entertainment. Meeting closed.

A. STEWART, Secretary.

Resolutions On Death of T. R. Welch

Whereas, Dr. T. R. Welch, an honored and useful member of the medical profession of Jessamine County was suddenly taken from our midst as the result of the fatal accident, April 24th, 1929, we the members of the medical profession and of the Fayette County Medical Society, feel individually and as a society, that our profession and his community has sustained an irreparable loss.

Dr. T. R. Welch, by his medical skill and untiring efforts has made a deep and lasting impression on the lives and hearts of those of his profession and his community who knew him well. While we know that death is as good as life and just as natural, we are appalled by the sudden tragic ending of his career, and our hearts are wrapped in gloom at the loss we have sustained, yet we are not ungrateful or unappreciative of the influence he left us, acknowledging ourselves greatly enriched by his contribution to his profession.

We sorrow with his family and friends in this tragic hour; their loss is our loss, yet both they and we are richer in experience because we have known and loved him. Not only for them but for us all, the winsome personality, gentle voice

and the presence which brought cheer, hope and health to many sufferers is no more. It is not only a comfort, but an inspiration to those of us left behind, to know that even in his tragic going, he still upheld the ideals of his profession—in that he gave his life endeavoring to save a life.

Be it Resolved, that these resolutions be spread upon the minutes of the Fayette County Medical Society, a copy sent to his family, our daily papers and the Kentucky State Medical Journal.

J. A. STUCKY, Chairman.

W. B. McCLURE,

DAVID BARROW.

Breathitt: At a called meeting of the Breathitt County Medical Society, which met in O. H. Swango's office in the Hogg building, Dr. M. E. Hoge was elected president, O. H. Swango was elected secretary, Dr. Wilgus Bach elected as delegate to the State Society meeting.

Those present at the meeting were: Drs. Bach, Hoge and Swango, all of Jackson, Ky. There being very few doctors in Breathitt county, only one or two not being present.

O. H. Swango, Secretary.

Bourbon: The Bourbon County Medical Society held its regular monthly meeting on Thursday evening, May 9th, 1929 at 8 p. m. The meeting was held in the County Court House in Paris, Ky.

The minutes of the preceding meeting were read.

The following members were present: Drs. H. B. Anderson, J. C. Hart, H. M. Boxley, C. G. Daugherty, L. R. Henry, J. T. Brown, M. J. Stern and J. A. Orr.

Visitors present were: Drs. Scott Breckenridge, Chas. Vance and W. M. Brown, of Lexington; Drs. S. R. Henry and Geo. Doyle, of Winchester; Marshall McDowell and J. M. Reese, of Cynthiana; Misses Purcell and Snyder, of the Massie Memorial Hospital, and Dr. J. E. Croley, of Paris.

Dr. C. G. Daugherty reported a series of cases of cranial injuries. This was discussed by Drs. M. J. Stern and Chas. Vance.

Dr. Scott Breckenridge, Lexington, read a paper on "Toxemia of Pregnancy," dealing briefly with the pathology and etiology but more fully with the treatment.

The discussion was opened by Dr. S. R. Henry, followed by Drs. H. M. Boxley, L. R. Henry, J. A. Orr, Marshall McDowell, C. G. Daugherty, Chas. Vance, M. J. Stern, H. B. Anderson, and in closing, by Dr. Breckenridge.

Adjourned.

MILTON J. STERN, Secretary.



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Granger's Physical Therapy

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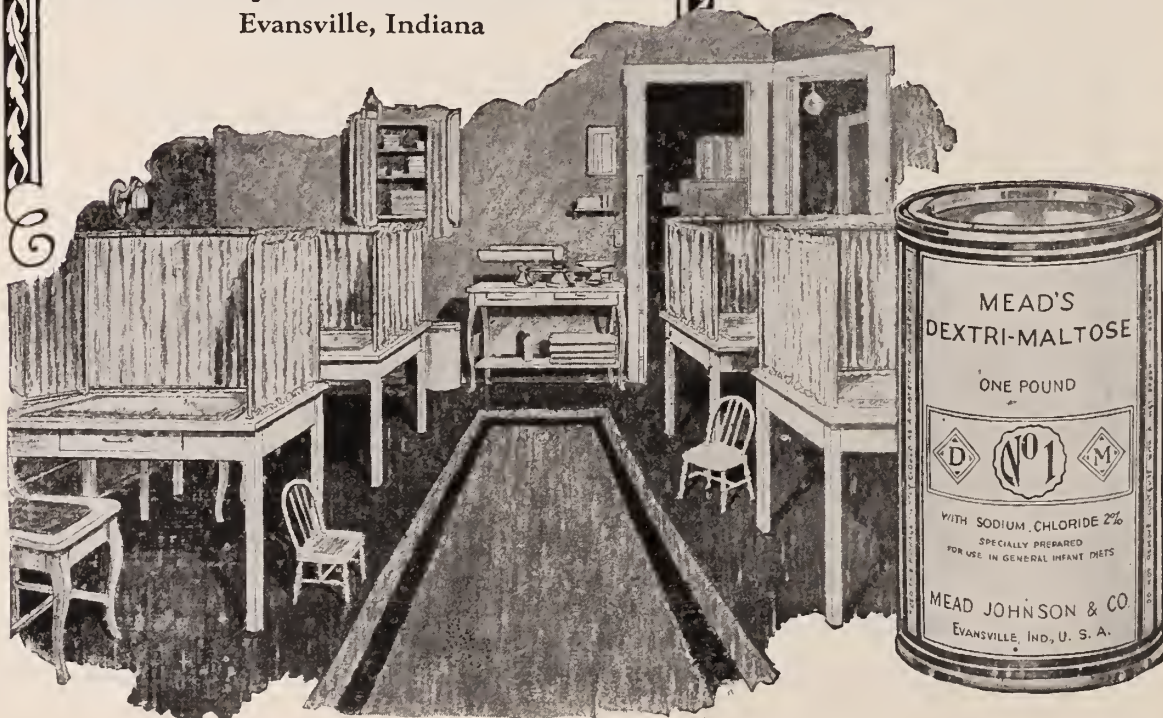
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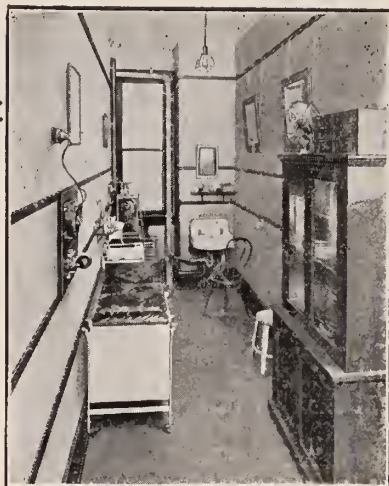
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EDITORIAL

AN INTERESTING VISIT

Upon the initiative of the President of the Association, Doctor Blackburn, Doctor Granville S. Hanes, President-Elect, and Doctor A. T. McCormack, Secretary, have just had the privilege of making official visits to the County Societies in Calloway, Graves, Henderson and Daviess counties and in the Southwestern District Society at Paducah. Practically every physician in these several Units was present. The Officers of the State Society were privileged to lay before them reports of the activities of the Association and in return to secure from them numerous suggestions which will be of great value to the entire profession.

It is of interest that the meeting in Calloway County was the first for some twelve or fifteen years. This County has started again, with the determination to succeed in its medical organization and, in furtherance of this, has organized a strong Woman's Auxiliary and we feel confident that the profession in Calloway County will see a new day in their relationship with the public.

In Graves County the usually effective Society there had a wonderful meeting. The editor of the local newspaper, the representative in the Legislature and a number of influential citizens were present and assisted in the success of the meeting.

The Southwestern Medical Society, the oldest District organization in Kentucky, always has a good meeting. The program this time was of unusual interest and value. Dr. Hanes delivered a masterly address on "Specialism" and its discussion brought out many items of interest and value to those concerned with medical education and practice.

The meeting in Henderson was one of the most interesting we have ever attended. Everybody was astounded that Doctor Hanes was able to open his address with events that happened from two hundred thousand to two hundred million years ago and in the same speech bring it up to date and describe the latest improvements in the Hanes' position so ingratiatingly that everybody present was tempted to assume it.

The dinner given by the profession of Daviess County was a delight. There, too, the discussion of the supply of physicians for the

rural districts afforded the chief interest. Everywhere we found the profession thoroughly alive to this important subject, whose solution is the most important problem before our profession and the public.

Such a visit as this is of incalculable value both to the Societies involved and to the Association as a whole. Doctor Blackburn is very anxious during the summer to make similar visits in Central and Eastern Kentucky.

A FURTHER EXPERIENCE WITH SCARLET FEVER

Following the valuable field of experience in public health administration, some account of which appeared in a recent editorial in the Journal, the physicians of Webster County and its splendid Full-Time Health Department, assisted by the representatives of the State Board of Health, are now conducting a similar demonstration at Clay, Kentucky.

Clay is an attractive, modern town, with about two thousand residents and there are about one thousand others in the mining units just outside of the city limits. They have been having Scarlet Fever continuously since last July. At the time of the demonstration some twenty families were in quarantine. Beginning last November the four splendid physicians of this community undertook the suppression of the epidemic by the use of the much vaunted resiolated antigen. They also use the Scarlet Fever antitoxin for prophylactic purposes in a number of cases. The latter seemed effective for about two weeks. The former apparently had no effect at all, as cases occurred during practically every week following its administration and almost none of those to whom it had been administered were found to be immune unless they had subsequently developed Scarlet Fever.

Clay was placed under a close quarantine which extended for two and one-half miles from its boundaries. All of the inhabitants of the area were given the Dick test and nose and throat cultures for hemolytic streptococci were made. Those who were immune and who were free from the infectious bacteria were given permission to leave the quarantine area at pleasure. The immune carriers were requested to report to their family physicians for treatment; all of the susceptibles were im-

munized by the Dick method and the epidemic was rapidly brought under control.

The profession of Kentucky is again grateful to Doctor Gladys Dick, of Chicago, who consulted with us in this fine piece of work.

Because of the extent of the epidemic it was found that only about 20% of the population were susceptible and these will all have been immunized by the time this issue appears. Thus is recorded another historic event in the development of correct public health administrative practice under the leadership of modern scientific medicine.

The people of Clay are to be congratulated for the fine spirit with which they co-operated in the procedure. It has never been our privilege to see as many well-trained children in any other community in which we have had the privilege of working than we found in this thriving little town.

CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS

The surgeons of Chicago are planning a wonderfully interesting program of clinics for the nineteenth annual Clinical Congress of the American College of Surgeons in this city October 14-18, and are keenly interested in providing a complete showing of Chicago's clinical facilities. The program will be comprehensive and varied—all branches of surgery will be represented therein. Clinics will begin at 2 o'clock Monday afternoon and continue throughout the mornings and afternoons of the following four days.

Since the last Clinical Congress in Chicago (1923) clinical facilities in this city have been markedly increased through the erection of several new hospitals and the enlargement of some of the older institutions. Also, during recent years several new hotels have been built, including the Stevens with its 3000 guest rooms, so that there are first-class hotel accommodations for all who wish to attend. General headquarters for the Congress will be established at the Stevens Hotel, where there are ample facilities for all of the College activities, including meeting places for the scientific sessions, hospital conferences, committee meetings, etc.

Attractive programs for five evening sessions have been outlined by the Executive Committee. At the Presidential Meeting on Monday evening the President-Elect, Surgeon General Merritte W. Ireland, will be inaugurated, and on the same evening the Murphy Oration in Surgery will be delivered by Professor D. P. D. Wilkie, of the University of Edinburgh. Other distinguished visitors will participate in the scientific programs.

Bearing in mind the great popularity of these clinical meetings, registration in ad-

vance will be necessary as attendance will be limited to a number that can be comfortably accommodated at the clinics.

Reduced fares on the certificate plan have been authorized by the railways of the United States and Canada—the fare for the round trip being one and one-half times the regular one-way fare.

THE AMERICAN HEART ASSOCIATION

The activities and purposes of the American Heart Association, were given in an editorial in the June Journal.

The Scientific Session of this organization will be held in Portland, Oregon, on July 9, 1929, during the meeting of the American Medical Association.

We hope that all Kentucky physicians will attend this meeting.

We plan, from time to time, to hold heart clinics in the State, and any county society wishing to have one of these clinics can secure details by writing to the editor of the Journal.

THE GOLF TOURNAMENT

Arrangements have been completed for the Golf Tournament at the Annual Meeting. The committee composed of Dr. D. Y. Keith, Chairman, R. G. Spurling and J. A. Kirk have secured prizes and every physician, whether he can play or not is eligible. The Louisville Country Club, Big Springs Country Club and the Audubon Country Club have extended the privileges of their club to our members and the players can take their choice of these links.

The tournament can be played from Saturday, October 19th through Thursday, October 24th. These dates are selected so that every doctor will have an opportunity to enter the tournament and not miss any part of the program.

Prizes will be given for low gross, also a kickers tournament will be played with two or more prizes for the lucky ones.

THE POST GRADUATE COURSE

We are printing in this issue of the Journal the complete program for the Post Graduate Course to be held in Louisville from July 8th to 20th. The course is held under the auspices of the Kentucky State Medical Association, and all of the doctors in the State, and, in fact, those of the neighboring states, as well as the Alumni of the University, will be cordially welcomed.

In addition to the regular program, arrangements have been made for special bedside work for small groups who are particularly interested in any line of work. It is requested that those desiring this work register

at the office at the City Hospital Headquarters. The cost of the whole course is \$1.00; which pays for registration and the certificate of attendance which is issued to those present.

This course offers a splendid opportunity of brushing up in the departments of medicine and surgery, and, besides, many old friendships are renewed, and new ones formed. Those who took the course last year will be welcome again, as well as those to whom this will be the first time. Headquarters will be at the City Hospital, and the mail will also be cared for at that point.

Any further advice or information can be obtained from Dr. Philip F. Barbour, Chairman of the Post Graduate Course.

Make this your summer vacation. Louisville offers many attractions to the "tired

business man." A splendid stock company at the Brown Theatre shows all the latest Broadway successes for the moderate price of \$1.00 for the best seats. Privileges of four golf courses will be extended, through requests to members of these clubs, to all the physicians attending the school. Louisville has two magnificent, free, open-air swimming pools, and the Y. M. C. A. will extend its privileges at a very modest sum. All of the places of amusement have a cooling system, so that a pleasant evening can be enjoyed.

The State Board of Health will open all its offices for the use of physicians, and the directors of all the departments will be at their desks each day for information and explanation of all the details of this work.

THE KENTUCKY STATE MEDICAL ASSOCIATION SUMMER POST GRADUATE COURSE

First Week—July 8-13

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 to 9	Clinics in Various Hospitals (Bulletins each day).					
9 to 11	Laboratory	Physical Diagnosis	Laboratory	Physical Diagnosis	Laboratory	Physical Diagnosis
11 to 11:30	Griffith Ac. Mastoid	R C M'Chord	Bennet Dietetics	Grant GU	Bennett Dietetics	Long Anesthesia
11:30 to 12	Pritchett	John Moore		Clinic		
12 to 1	Wathen Goitre	Speidel Obstetrics	Sherrill Clinic	Speidel Obotetrics	Kavanagh Tularemia	Special Obstetrics
Lunch						
2 to 3	Pickett	Jenkins Medical Clinic	Pickett	Wolfe Eye Clinic	Pickett	
3 to 4	Prenatal Clinic	Trawick Orthopedic Clinic	Postnatal Clinic	Young Skin and Syphilis	Prenatal Clinic	
4 to 5	Bruce Infant Feeding	Turner Periodic Examina- tion	Bruce Infant Feeding	Barbour Pediatric Clinic	Turner Periodic Examina- tion	

Second Week—15-20

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 to 9	Clinics in Various Hospitals (Bulletins each day).					
9 to 11	Laboratory	Physical Diagnosis	Laboratory	Physical Diagnosis	Laboratory	Physical Diagnosis
11 to 11:30	Ward	Blackburn Acute Abdomen	Trip to Waverly Hill Sanato- rium and Lunch	Ward	Simpson	Ward
11:30 to 12	Rounds			Rounds	Diabetes	Rounds
12 to 1	Hagan Surgical Clinic	Hibbett Gynecol. Clinic		Abell Gall Bladder	Hibbett Gynecol. Clinic	Award of Diplomas
2 to 3	Lunch and Ward Rounds	Jenkins Medical Clinic		Wolfe Eye Clinic	Dabney Ear, Nose Clinic	
3 to 4	Children's Hospital	Miller Orthopedic Clinic		Hanes Rectal Clinic	Moren Nervous Clinic	
4 to 5	Keith X-Ray	Hendon Fractures		Barbour Pediatric Clinic	Hendon Fractures	

OFFICIAL ANNOUNCEMENTS

PRELIMINARY PROGRAM KENTUCKY
STATE MEDICAL ASSOCIATION

October 21-24, 1929

Tuesday A. M.

SCARLET FEVER SYMPOSIUM

Etiology and Symptomatology of Scarlet
Fever.

Dr. Jewett Marshall, Paducah, Ky.

Diagnosis and Treatment of Scarlet Fever.

Dr. C. M. McKinlay, Lexington, Ky.

Ear Complications in Scarlet Fever.

Dr. R. H. Cowley, Berea, Ky.

Tuesday P. M.

SURGICAL SECTION

Dr. Chas. A. Vance, Lexington, Chairman.

Papers to be read by:

Dr. W. P. Sights, Paducah, Ky.

Dr. C. W. Dowden, Louisville, Ky.

Dr. E. B. Bradley, Lexington, Ky.

Dr. J. G. Sherrill, Louisville, Ky.

Dr. J. M. Salmon, Ashland, Ky.

Tuesday Night

ORATION IN MEDICINE

The Public's Obligation to the Medical Pro-
fession.

Dr. E. L. Gowdy, Campbellsville, Ky.

ORATION IN SURGERY

History of Orthopedic Surgery, Illustrated.

Dr. W. Barnett Owen, Louisville, Ky.

Wednesday A. M.

Use of Iodine in Hyperthyroidism.

Dr. R. P. Ball, Louisville, Ky.

End Results of Five Years Work in Depart-
ment of Gynecology, University of Louis-
ville, at the City Hospital.

Gynecological Staff, U. of L.

The Injection Treatment of Varicose Veins.

Dr. Frank Strickler, Louisville, Ky.

Sacral Anaesthesia.

Dr. Cecil Gaston, Birmingham, Ala.

The Passing of the Country Doctor.

Dr. J. H. Hendren, Straight Creek, Ky.

Undulant Fever.

Wednesday P. M.

SYMPOSIUM ON DIABETES

Diabetes Mellitus.

Dr. Fred Speidel, Louisville, Ky.

Ocular Manifestations.

Dr. A. O. Pfingst, Louisville, Ky.

GENERAL PAPERS

The Use of Skin Grafts in Plastic Surgery.

Dr. F. M. Massie, Lexington, Ky.

Thursday A. M.

SYMPOSIUM ON INFLUENZA

Medical.

Dr. W. J. Shelton, Mayfield, Ky.

X-Ray Diagnosis of Complications of In-
fluenza.

Dr. C. D. Enfield, Louisville, Ky.

Surgical Treatment of Empyema.

Dr. E. S. Allen, Louisville, Ky.

Ear Complications.

Dr. J. W. Nolan, Harlan, Ky.

Psychosis Following Influenza.

Dr. H. B. Scott, Louisville, Ky.

Thursday P. M.

Relief of Pain During Labor.

Dr. L. C. Redmon, Lexington, Ky.

Intra-Cranial Hemorrhage of the New Born.

Dr. P. E. Barbour, Louisville, Ky.

Version and Extraction.

Dr. C. C. English, Louisville, Ky.

Broncho-Pneumonia in Children.

Dr. Clay Crawford, Fort Thomas, Ky.

**Use of Banana as Food for Healthy Infants
and Young Children**—

Scriver and Ross report their study on the value of the banana as a food for infants up to 2 years of age, one phase only of the subject being considered; namely, its use as a food for healthy infants over a long period of time. Banana was substituted for certain articles of diet which included sugar, potato and cereal (farina). These foods are for practical purpose carbohydrate foods containing small amounts of protein and traces of fat. They were fed in equivalent caloric amounts; 1 ounce by weight of banana pulp was used in place of one-fourth ounce of sugar, 1 ounce of potato or 2 fluid ounces of farina (made up from 1 ounce dry weight in 8 ounces of water and after cooking made up to the original volume). The bananas were carefully selected and used only when ripened. The fruit was kept at room temperature, not in a refrigerator room, and was considered ready for use when brown spots appeared on the skin and there was complete absence of any green on the skin, even at the tip. Ripened in this way and to this degree, the starch of the banana is practically all converted into sugar. In the case of infants of from 3 to 6 months, the banana was mashed finely, beaten, and incorporated as an emulsion in the milk formula. In the diets of the older infants in which banana replaced cereal or potato, it was mashed up finely and fed as such. Infants fed banana as a substitute for these foods take it well, digest it satisfactorily and show no change in the character of the stools. Their gain in weight over a period of weeks is roughly equal to the gain made by those on the control diet. The ripe banana thus provides a useful substitute for other foods of its class in healthy infants.

ORIGINAL ARTICLES

INOPERABLE HYPERNEPHROMA:
CASE REPORT*

By CLAUDE G. HOFFMAN, M. D., F. A. C. S.
Louisville.

Hypernephroma occurs with greater frequency, during adult life, than any type of renal tumor. It has rarely been encountered in children. While the growth is always potentially malignant, it is apparently benign in its early stages, since many such tumors discovered at necropsy produced no symptoms during life. However, it is classified as malignant, and metastasis is common in the lungs and elsewhere.

Hypernephroma is quite generally believed to arise in the suprarenal body, the kidney becoming involved secondarily; it is usually attached to the kidney, and, in some cases, its origin has been traced to the renal substance. Much confusion exists in regard to the origin as well as the classification of renal neoplasms. Some of the older authors regarded hypernephroma as a type of epithelioma. Many other malignant tumors of the kidney have been described.

It is noteworthy that hypernephroma may be present for many years without causing symptoms and thus remain undiscovered. A few cases have been recorded in which metastasis occurred before the existence of a renal tumor was even suspected. In most instances, however, the patient complains of pain and a gradually enlarging tumor in the kidney region. As the size of the growth increases pressure symptoms become more pronounced, hematuria is common, and renal function is impaired or destroyed.

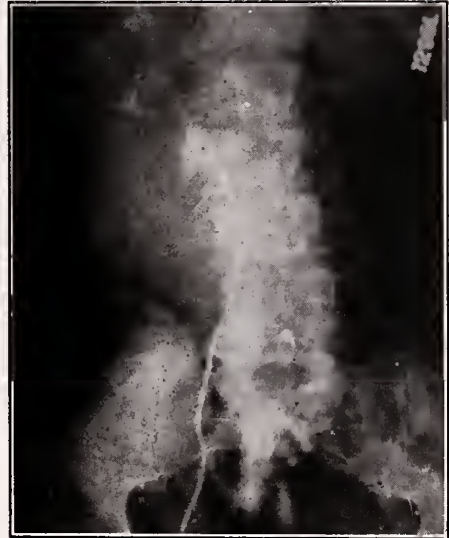
In the case to be reported the tumor had reached such dimensions that it was readily palpable in the loin and upper abdomen, and the function of the kidney had been practically destroyed. The tumor had probably been present for several years, yet so far as could be determined by examination there was no metastatic involvement.

CASE REPORT

J. F. H., male, aged 66, from the interior of Kentucky. Date of first observation, January 5th, 1926. Family history: father died at 63, "heart trouble;" mother died at 60, "indigestion." Two brothers, one 48, the other 64, and one sister 40, living and well. One sister dead, pulmonary tuberculosis; one brother dead, appendicitis. The patient's personal history was essentially negative; he had the usual disorders of childhood, no other illness, no operations.

When this man came under my observation

he complained of a growth in his right side which thought to be a kidney tumor. He did not know when the growth began, nor could he remember when he first noticed its pres-



ence. He complained of a dull, aching pain in his back, not very distressing, but constantly present. He stated that he had a fall in May or June, 1925, and thought this might have started his trouble. He has had no severe pain at any time, no disturbance of urination, says he sleeps well, appetite good.

Physical examination revealed a well developed and fairly well nourished man. The left kidney could not be palpated. There was a tumor-mass in the right upper abdominal quadrant extending four finger breadths below the umbilicus. The growth was movable and apparently involved the kidney or was attached to it. Rectal investigation showed the prostate gland to be practically normal.

Cystoscopic examination: Vesical capacity 250 c.c. Patient very tolerant to No. 24 F. double catheterizing cystoscope. The vesical interior showed nothing of importance, except that the right ureteral orifice was red and edematous, and some adjacent trabeculation was noted. A No. 6 ureteral catheter was introduced to the right renal pelvis with no obstruction. The left ureteral orifice was normal in appearance and location. The same size catheter was passed to the left renal pelvis with no obstruction. Urine from the left side drained normally, that from the right side was scanty and blood-tinged. One c. c. of phenolsulphonaphthalein injected intravenously appeared on the left side in eight minutes. There was none from the right side after a half hour interval. Dye from the left side showed only 6 per cent the first fifteen minutes, 8% the second fifteen minutes. Sodium iodine was injected on the right side for pyelogram; only 3 c.c. could be injected

*Read before the Jefferson County Medical Society.



with some difficulty.

Laboratory findings: Blood count practically normal. Hemoglobin 90%; leucocytes 5,490. The urine contained no casts; a few leucocytes and an occasional erythrocyte noted. Chemical examination showed the urine to be practically normal.

Diagnosis: Hypernephroma of right kidney, inoperable because of low function and limited phthalein output on left side. Nothing further was attempted and the man allowed to go home.

The patient returned to Louisville December 9th, 1927. He was then emaciated and there was profuse hemorrhage from the right kidney. The tumor-mass previously described was somewhat larger than at former examination. Blood count: erythrocytes 5,000,000, hemoglobin 80%. The urine contained so much blood that it could not be examined. Fibrogen administered intramuscularly availed nothing. The vesical cavity was emptied of organized blood clots through the cystoscope. A catheter could not be introduced to right renal pelvis owing to organized blood clots in the ureter. A catheter was passed to the left renal pelvis, and 1 c. c. of phenol-sulphthalein then injected intravenously. No dye appeared until after twelve minutes, and then showed a combined output of only 15 per cent for the two periods of fifteen minutes each. Strange to say, the hemorrhage ceased after cystoscopy. The patient was then given deep x-ray therapy by Dr. C. D. Enfield and allowed to go home.

He again returned to Louisville January 25th, 1928. He had then gained twenty-two pounds in weight, but the tumor-mass had not appreciably retracted. At that time a catheter was introduced to the right renal pelvis, but only 6 c. c. of sodium iodide (13 per cent) could be injected for pyelogram. The com-

bined phthalein output on the left side was still less than 20 per cent.

DISCUSSION

Irvin Abell: There are two or three points about Dr. Hoffman's presentation which I desire to discuss briefly. The origin of hypernephroma has been the subject of dispute for a long period of time, in fact ever since Grawitz published his theory that these tumors originated in fetal inclusion of suprarenal tissue in the kidney substance; which was vigorously disputed by Wilson. I think the majority of investigators have agreed with Grawitz that the tumor develops from an adrenal cell or rest. This has been proved by studies on a 16 mm. embryo, with the analysis of the genital ridge and urinary tract in position, showing that the adrenal cells are not so clearly differentiated as formerly supposed, nor are they definitely separated by fibrous tissue. As a matter of fact, hypernephroma is found in every portion of the urinary tract, even in the testis of the male; and in every portion of the genito-urinary tract in the female, including the broad ligament; in both sexes the tumor has been found in the ureter, even in the upper abdomen, the liver and pancreas. Beer studied one hundred and fifty livers and states that he found six among these with adrenal cells. There have been reported within the last few years twelve cases of so-called primary hypernephroma of the right lobe of the liver; none of the left lobe of the liver. These tumors are all alike though growing in various situations in close association with the structures to which they have become attached.

An interesting feature in Dr. Hoffman's report is that the patient has lived for such a long period of time and has even gained 25 pounds in weight. One observer, whose name I do not recall, three years ago published a paper giving the results of his studies on the pathology of hypernephroma. He stated that one could determine by microscopic examination the relative degree of malignancy of the tumor. Those in which the cell were of the signet ring type, containing a large quantity of fatty material with the nucleus pushed to one side, were comparatively benign; while the tumors showing cells, the cytoplasm of which was granular and not fatty, were highly malignant.

I am sure all of us have had the same observation Dr. Hoffman has outlined in connection with hypernephroma. Eight years ago a young woman came to me for examination claiming that she had been losing weight for some time. She had then developed a tumor in the upper abdomen the size of a cocoanut, which, on removal, proved to be an hypernephroma of the kidney. The woman is still living. While the tumor was very large it was apparently benign, as there has been no recurrence nor evidence of metastasis.

In other cases the tumors of the kidney have

been very small, yet they were promptly followed by multiple metastases, pursuing the typical course of carcinoma, of which these tumors are a type.

J. Garland Sherrill: The case reported by Dr. Hoffman is very interesting. Dr. Abell read a most instructive paper on primary hypernephroma occurring in the liver before the last meeting of the Southern Surgical Association. The most important feature in the case reported by Dr. Hoffman is that the patient has had a removable tumor of the kidney since January, 1926, yet no attempt has been made to remove it. Even though the phthalein test may show renal function below normal, the patient ought to be given a chance for permanent cure by operation. There is regeneration of kidney tissue with increase in size and function after partial removal, just as there is regeneration of the urinary bladder after a part of it has been removed. Therefore, in this case if the right kidney does not function properly and the left kidney functions sufficiently to keep him going, why not improve his physical status and renal function by appropriate treatment then remove the tumor and save his life? If the tumor is malignant, he has nothing to lose, if it is benign he certainly ought to have the kidney removed to prevent progress to the point where it might by its size and weight produce his death. I think the man should have had the tumor removed when Dr. Hoffman first saw him in 1926.

Claude G. Hoffman, (in closing). I thank the gentlemen for their discussion of my report. It is recognized that there is no possible way to determine whether or not this tumor has begun to show malignant changes. However, careful examination revealed no evidence of metastasis, the patient has gained in weight and feels well regardless of the low renal function.

The point I particularly wished to emphasize is that a tumor of the size described has probably existed eight or ten years and yet the patient knew nothing about it. I recall a patient seen three years ago who had several metastatic tumors involving the glandular structures in various parts of the body; in that case the hypernephroma of the kidney was not discovered until after the secondary or metastatic growths had appeared. How long the hypernephroma had been present could not be determined.

In the case mentioned by Dr. Abell, the woman had been trying to reduce her weight and during the process of reduction was taking physical culture, and it was thought this might have produced the mass in her upper abdomen. The pyelogram was practically normal, it only showed the renal pelvis and calyces displaced upward under the diaphragm. The question was whether this mass involved the kidney or whether a tumor existed which was pressing the kidney upward. As Dr. Abell stated, operation disclosed an hypernephroma.

In the case reported the patient was sent to me from another city for diagnosis. A physician in his locality had advised him to return home and by appropriate treatment improve his physical status until he could be safely operated upon. The patient told me if he had to undergo an operation he would go to the Mayo Clinic. I did not see him again until a year later, when he returned with profuse hemorrhage from the right kidney. He was then emaciated and in poor physical condition. Hemorrhage ceased after cystoscopy, and deep roentgen-ray therapy was used. He improved afterward in a most remarkable way.

Nephrectomy was advised when the patient originally came to me for examination, but he declined to consider it. When he returned the last time greatly improved following roentgen-ray treatment, operation was again urged. However, the man stated that as he had carried the tumor for possibly eight or ten years and was still living he proposed to continue carrying it.

CREEPING ERUPTION*

By James E. Winter, M. D., Louisville.

Creeping eruption is a skin disease characterized by raised linear lesion which advances from time to time. It was first described by Lee, (1) in England, 1875. It may be caused either by larva of various flies, such as the horse bot fly, as described by Samson-Himmelstjerne (2) in 1895 or the cattle heel fly; or by the third stage larva of one of the dog and cat hook-worms *Ancylostoma Braziliense*. The last is frequently encountered along the Southern Atlantic and Gulf coast, although it has been known as far north as the New Jersey coast. The causative agent has been carefully studied by Kirby-Smith, White, and Dove (3) (4).

The infection usually takes place among children playing on the beach or, more commonly, in sand piles. It also occurs among mechanics who have been working in damp sandy places, particularly beneath houses. The inoculation is often accompanied by an intense tingling which, in a short time, is followed by the formation of a papule. The linear erythematous track appears somewhat later. As far as I know this is the first case to have been reported in Kentucky.

I am indebted to Dr. E. Dargan Smith, of Owensboro, with whom I saw the case and who made the photograph.

Case Report

Miss C. was born and lived for two and one half years at Morehead City, N. C., which is a sea coast town. During the summer of 1927 she played daily in a sand pile but was not on beach later than May 1927. She came to Louisville, September 1, 1927. In the latter

*Read before the Jefferson County Medical Society.



part of October the child complained persistent tickling and biting about the anus. January 8, 1928, parents noticed a slight induration and redness in the anal fold. This persisted for two weeks during which time soothing ointments were used. January 24th a small mole-like track was noticed leading from the indurated anal fold across the right buttock. This track traveled upward looping upon itself for a total distance of 8 inches within a period of two months. Efforts to locate the larva with hand lens and glass slide were unavailing. March 28th an area of skin 3x4 cm. over suspected area was frozen with ethyl chloride. There was hyperemia over frozen area followed by purple mottling. Two weeks later there was a slight rose-colored spot, the skin recovering normal appearance without sloughing or untoward events. To date no evidence of life has been shown by larva.

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- (3) Kirby-Smith, J. L., Dove, W. E., and White, G. F. Arch. Dermat. and Syph 13:137, 1926.
- (4) White, G. F. and Dove, W. E., Jour. A. M. A. 90:21, 1701

DISCUSSION

C. Brooks Willmott: Dr. Winter has reported a very rare and interesting case. In my opinion there is no question about the correctness of the diagnosis although the larva was not demonstrated. I think this is the first case of creeping eruption that has ever been reported in Kentucky.

Creeping eruption is a strange disease. It is

caused by a parasite which burrows beneath the skin and then migrates like a mole burrowing under the surface of the ground. As Dr. Winter has stated, there are several varieties of larvae which must be considered as etiologic factors. The disease is known by several other names, but creeping eruption is expressive and covers all types.

The disease is certainly very rare in this part of the country, and Dr. Winter is to be congratulated on making the diagnosis.

Impacted Intracapsular Fractures of the Neck of the Femur.—Judet reports five cases of impacted intracapsular fractures of the neck of the femur. At roentgen examination it was found that the distal fragment of the neck was impacted in the cephalic fragment. Four patients were unable to walk; the fifth one could walk. Four patients were cured by immobilization with extension; the fifth one, in whom the impacted fragments were mobilized before the application of a plaster cast, developed a pseudarthrosis. The author thinks that the prognosis is good in impacted intracapsular fractures of the neck of the femur, if the impaction is left untouched and the fragments are not dislocated by rough manipulation, because of the difficulty of the consolidation of free fragments in old people.

THE VALUE OF STRAMONIUM IN THE PARKINSONIAN SYNDROME*

By JOHN J. MOREN, M. D., Louisville.

It is generally accepted that 50 to 80 per cent of those who recover from an attack of epidemic encephalitis suffer some more or less permanent defects.

These sequela are as varied as are the functions of the cerebrospinal nervous system. Any portion can become involved and therefore a variation of symptoms. The most frequent or common sequel is the Parkinsonian syndrome. Possibly next would come choreic or athetoid movements.

Other manifestations, as upward movement of the eyes, spoken of as oculogyric crises; rapid breathing or slow breathing, yawning, narcoleptic attacks and tic movements. Various pictures of loss of functions, as paralysis, anaesthesia. Of the mental side behavior disorders are quite common, which frequently increase necessitating institutional care.

The type referred to in this discussion will be the Parkinsonian syndrome, and the ocular crises. It is interesting that this particular disease should strike that portion of the central nervous system which has been least understood, that is, the basal ganglia. From the post-mortem findings in cases of the Parkinsonian syndrome the most consistent changes have been found in the substantia nigra and the striated body. The symptoms originating from lesions in the basal ganglia are referred to as extra-pyramidal, and are manifested more in the disturbance of motion and the tone of the general musculature, consequently in the Parkinsonian manifestation we have muscular rigidity, slowness of motion, with tremor as the leading symptoms in this syndrome. It is established that lesions in the basal ganglia give rise to the paralysis agitans group of symptoms.

If the caudate nucleus suffers most, it seems that the choreic or athetoid movements are manifested. This is borne out by the pathology of Huntington's chorea, as in this particular disease the caudate seems to suffer more than the lenticular nucleus.

As for the explanation of the ocular and respiratory crises, narcoleptic attacks and the various other sequela no real basis has been found. Several articles have appeared upon these crises, but opinions are speculative as to whether it is subcortical or from the basal ganglia.

Treatment: Like all chronic diseases a great variety of drugs have been tried, none of which have seemed to have any effect on the progress of the disease, or control of the symptoms. There are only three measures that have really proven of material value in

my hands. (1) The general alterative tonics, as arsenic, iron, etc., which may correct any secondary anemia. These do not check the degenerative process at all. (2) Physical exercise for reduction of contraction of muscles. (3) Sedatives to control the muscular rigidity, tremor, etc. All kinds of sedative medication have been tried. None seem to give as good results as the atropin group, hyoscine, scopolamine and stramonium. This group seems to give better results in controlling symptoms than anything else.

My attention was called to stramonium by an article which appeared in the *Journal Nervous and Mental Diseases*, Nov., 1928, by Dr. Sophia Shapiro, Oak Forest, Ill. She wrote as follows:

"In 1924, Juster obtained remarkable results following the administration of datura stramonium in treatment of Parkinsonian states. He demonstrated his first patient at the Neurological Society of Paris in Feb., 1925, and recommended the drug as the "daily bread" of Parkinsonians.

"The dose should be small to begin with and gradually increased until the slightest toxic effect is reached. In his experience the drug could be given even in doses as large as 1½ grams daily (24 to 36 grains). After good result is reached the dose should be gradually decreased and a dose of eight grains a day can be tolerated for months and months. He did not see any bad effect from its use.

"Juster prescribed dry leaves of stramonium orally, given in small doses every one or two hours. The only untoward symptoms from the prolonged use of the drug were sometimes diarrhea or ocular symptoms (mydriasis). Those symptoms disappeared as soon as the medication was discontinued for one or two days, and the dose gradually decreased."

"My own observations with datura stramonium were started in Nov. 1926. I am reporting 23 cases, 16 of which showed Parkinsonian and 7 were classical paralysis agitans.

"In some of my patients I noticed remarkable effect in a few days. The other patients improved more or less slowly. Every one improved in some way. I did not notice any bad effect at all. The doses that I used were not as large as Juster used. I started with one grain dose given by mouth three times a day, and increased the dose gradually until 14 to 16 grains a day. As soon as I obtained favorable optimal result, I decreased the dose gradually until 7 to 8 grains were reached. I allowed one day of intermission after five or six days of medication.

"I noticed excellent results in 14 cases; 11 Parkinsonian, 3 paralysis agitans, 9 cases slow improvement. The main signs improved were muscular rigidity, over-salivation, posture,

*Read before the Louisville Medico-Chirurgical Society,

speech and mental condition.

"It is apparent that *datura stramonium* gives our patients symptomatic and perhaps a temporary relief of the morbid symptoms, and it will have little or no effect on the course of the malady. But considering the simplicity of the medication and the results obtained, we should consider *datura stramonium* the best palliative remedy in Parkinsonism. Bringing a patient from complete or partial invalidism to a more or less useful life, or even more pleasant life, makes the drug worth due consideration."

E. A. Carmichael and F. H. K. Green in *The Quarterly Journal of Medicine*, Oct., 1928, in the study of the effects of stramonium, hyoscyne, and other alkaloids speak as follows:

"Comparison of Therapeutic Effects of Hyoscyne and Stramonium.

1. Instrumental observations. As regards the instrumental records alone there would seem at first to be little to choose between these three lines of therapy; **any one** of them in adequate dosage would convert the tracings almost to normality. Stramonium by mouth had a more beneficial effect upon the ergograph tracings than had hyoscyne, either by mouth or subcutaneously. The hyoscyne tracing might be nearly as rapid as the stramonium tracing, but tended to be less regular in time and amplitude, this is well shown in Fig. 6. The rigidity curves gave results slightly in favor of stramonium, but the essential superiority of stramonium over hyoscyne medication lay in a comparison of the clinical picture with instrumental records.

2. Clinical observations. In addition to the five patients admitted to hospital for instrumental observations, twenty patients were treated with hyoscyne and with stramonium in the Out-patient Department. Seventeen of these were post-encephalitic cases; the other three were elderly patients with idiopathic paralysis agitans. Both hyoscyne and stramonium had considerably less beneficial effect in these three patients than in the others; further, the older the patient the more susceptible to toxic symptoms he appeared to be. The two older of our patients with paralysis agitans were unable to tolerate even 25 minims of the tincture of stramonium by mouth, and the benefit obtained by giving smaller doses of this drug was practically negligible. In the case of the younger post-encephalitic patients, very large doses of stramonium were well tolerated, and in every case clinical improvement was obtained.

In some of the patients the improvement was dramatic. Cases 1 and 3 were admitted to hospital bed-ridden; before treatment they had to be fed and washed, and their nursing occupied much time of the ward staff; they

had constant dribbling from the mouth. After a few doses of stramonium they became less dependent upon the nursing staff, and on full dosage they were able to get up and dress themselves and even help in the ward routine. The dribbling of saliva ceased, while mentally they became more alert and cheerful. Each one of the patients has remarked that on stramonium he or she has felt enormously better; this corresponds with the experience of the French observers who used this drug. On physical examination of the patients treated with stramonium, the following points were noted: the face became less mask-like, and the facility of expressional movements to some extent returned; rigidity was in all cases diminished, and the range of voluntary power increased; incidentally, as stated, the mouth became dry and dribbling ceased, while it was noted that the skin became less greasy. On the other hand, tremor appeared to be little, if at all, affected by the drug; in two cases it became slightly more evident under treatment.

Two examples of marked improvement under stramonium treatment seem worthy of special mention. One is a woman who was carried into hospital on a stretcher; she had for months been incapable of doing anything for herself. She has now been taking tincture of stramonium, minims 75, thrice daily for a year; she does her own housework and even manages to earn a living as a laundress. The other is a girl who on account of disability, had lost her secretarial post in the city; she is now back at work, and a few weeks ago was promoted on account of her capabilities as a typist.

Comparing these results with the effects of hyoscyne, it was found impossible to produce similar subjective or objective improvement with hyoscyne by mouth. Hyoscyne subcutaneously gave very similar effects, but they were more evanescent than those produced by stramonium treatment. Further hyoscyne in the large doses necessary to produce such effects was apt to cause mild delirium; in two in-patients it had to be stopped on the request of the hospital sister, as the patient's exuberant expletives were causing annoyance in the ward. The toxic effects of stramonium, though similar to those of hyoscyne, seemed to be much less, and the patient who was taking sufficient stramonium to produce normal tracing was generally untroubled by severe toxic symptoms. Even case V., who was quite intolerant of hyoscyne was able to take 45 minims of tincture of stramonium thrice daily without ill effect other than slight xerostomia. The undesirability of repeated sub-cutaneous injections is a further point against the use of hyoscyne in the out-patient department.

We have therefore, come to the conclusion

that stramonium, as a method of palliative treatment, is more potent than hyoscine by mouth, and possesses obvious advantages over hyoscine subcutaneously.

Dosage and toxic effects of stramonium. Unlike the French observers who used powdered stramonium leaves in pills, we have adhered almost entirely to the tincture of stramonium in these investigations. Two out-patients were treated for a short time with a dry preparation of this drug, but the results were disappointing. Each patient has received stramonium in dosage varying from 20 to 90 minims of the tincture by mouth thrice daily. The initial dose given has usually been 20 minims. In two patients the effects of increasing dosage have been observed graphically; charts are appended showing the results (Fig 7); it is obvious from these that in order to obtain the maximal beneficial effects of the drug it is necessary to give doses far above the pharmacopoeial upper limit (15 minims). The dose could be increased daily till the optimum was reached. The best results were obtained with doses of 45 to 60 minims thrice daily; beyond that level no further improvement usually occurred, and in two cases a definite regression took place in the ergograph tracing and rigidity curves, when the dosage was increased up to 75 and 90 minims. This was confirmed by experience in the out-patient department, though the optimum dose varied somewhat in individual cases. Once the optimum dose has been found, the patient can be kept at that level apparently for an indefinite period with constant relief of symptoms. Case 1, in the instrumental series has taken 75 minims thrice daily for over a year, and, as stated above, she is now able to earn a living as a laundress. She is quite untroubled by toxic symptoms.

The toxic effects of stramonium vary intensely from case to case, but the age of the patient seems to have a definite bearing upon them. The elderly patients with idiopathic paralysis agitans appear to be more intolerant of the drug than the younger post-encephalitics. The youngest patient so far treated, a boy of 12, has taken 60 minims of the tincture thrice daily for several months without any adverse effect.

In patients susceptible to the drug, toxic symptoms may appear with any dosage over 30 minims thrice daily; the first symptoms usually complained of is blurred vision; next comes dryness of the mouth, nausea, and occasional vomiting. Two patients developed attacks of diarrhoea, but these ceased on a reduction of the dose. The pulse rate was unaffected in all; in no case was delirium produced, nor was any toxic rash seen. It was observed that during the early stages of this treatment all the patients lost weight; after

a period of time this ceased and weight was ultimately gained. It will be seen that compared to those of hyoscine, the toxic effects of stramonium are on the whole mild. The most striking testimony to their mildness is afforded by the fact that when, owing to the development of nausea, the drug has been suspended, the patient has almost invariably asked that it be restored.

It has been found possible to mitigate the poisonous effects of stramonium in various ways. The blurred vision, due to pupil dilatation, is considerably relieved by the daily instillation of one drop of 1-4 per cent eserine into each eye; it is sometimes sufficient to do this every other day. The dryness of the mouth and fauces was combated by giving "Thirst-quencher tablets" (Burroughs, Wellcome and Co.) to be dissolved in the mouth; a few patients found relief by the addition of tincture of jaborandum to the stramonium mixture. It was found that in most cases this distressing symptom became better tolerated by the patient as time passed. Nausea and vomiting were usually only relieved by lessening the dosage of stramonium, it was found, however, that careful attention to the bowels and avoidance of constipation somewhat abated these symptoms.

This investigation, though carried out on only a few patients, suggests that the tincture of stramonium contains active principles as yet unrecognized, or that it is made up of a combination of known alkaloids, which combination produces a better effect than any of its components.

CONCLUSIONS

1. Tincture of stramonium in large doses lessens the Parkinsonian rigidity and increases the ability to perform fine rapid movements as graphically recorded.
2. It appears to improve the mental condition of the patient. ?
3. It does not affect the tremor.
4. It is at least as efficient as subcutaneous hyoscine in large doses, is better than hyoscine by mouth, and may be given continuously over a long period of time.
5. The optimum dosage necessary to produce this effect varies in individual cases, though it commonly lies between 45 and 60 minims thrice daily.
6. Toxic symptoms even with this large dosage are rarely severe; they may be combated in various ways; they appear to be more common in elderly patients with idiopathic paralysis agitans, than in the younger post-encephalitics.
7. The whole tincture of stramonium is more efficacious than atropine or levo and dextro-rotatory hyoscyamine.
8. The action of stramonium is palliative and not curative."

In November, 1928, I began the use of stramonium with the following results:

Dr. H., aged 61, typical paralysis agitans. Patient tried on two occasions to take the stramonium, four grains a day, and after five doses it disturbed his digestion so that he discontinued it.

Dr. W., aged 60, Parkinsonian syndrome, mostly rigidity and slowness of motion. Stramonium was suggested and he gave it a short trial and believes that the scopolamine 1-200 serves him better.

A. R. F., aged 53, typical Parkinsonian syndrome, marked salivation and tremor of lower jaw. This patient lives in a distant city and reports very satisfactory effect from the stramonium. He is satisfied.

L. G. S., aged 68. Tonic spasms of feet and throat, diagnosis undetermined. Could not take stramonium. He complained of it choking him. Disturbed vision and increased rapidity of pulse.

J. A. L., aged 36, Parkinsonion syndrome, with disturbance of the movements of the eye. He has crises of upward turning of the eyes and staring. These attacks necessitated him leaving his work two or three times a week. He was given stramonium in November, 1928. It was pleasing to see the results. It controlled the eye crises and the rigidity, and he appears a different man. Since taking stramonium he has not left his position but two or three times.

A. L. K., aged 60, typical Parkinsonion syndrome. This man is a carpenter and since taking stramonium he is now able to do more work.

C. A., aged 59, Parkinsonion syndrome. Chief symptom muscle rigidity. Stramonium improves the rigidity and has better use of extremities.

H. W. Typical Parkinsonion syndrome. He was benefitted by the stramonium for a time. He developed some digestive disturbance and called his family physician. The stramonium was discontinued.

Mrs. H. E., aged 52. Crises of inability to open eyes. Stramonium certainly controlled these crises better than scopolamine.

L. B. F., aged 35, Parkinsonion syndrome. Stramonium controlled his symptoms splendidly. Patient left off the medicine and all symptoms returned. He complains of a smothering sensation after taking tablets.

G. Mc., aged 17, Parkinsonion syndrome. Ocular and yawning crises. This young girl has been benefitted by stramonium. The menstrual period has become regular, and constipation has been corrected, and so far no unpleasant effects from the stramonium.

Mrs. B., aged 31. Parkinsonion syndrome with crises of protruding tongue. Stramonium controlled the rigidity but had little ef-

fect on the tremor. She complains that the medicine caused cramps in the stomach. By varying the dose of stramonium she is able to control the rigidity. The tremor has not been controlled.

E. W. No report.

Lucile B., aged 17, Parkinsonion syndrome, rigidity and slight tremor in one arm. She was benefitted by two grain stramonium each day.

H. D. A., aged 29, Parkinsonion syndrome, chief symptom rigidity and ocular crises. Marked improvement in eye crises and rigidity.

CONCLUSIONS

My experience so far with stramonium is that it seems to benefit the ocular crises best. It certainly influences the rigidity, but has less effect upon the tremor. There are some cases that do better with scopolamine than with stramonium. It does not act well in elderly people. It seems to me that stramonium is a drug well worth trying in these cases, and we have the opportunity to select another sedative drug than scopolamine or hyoscine.

DISCUSSION

Henry G. Barbour: I have enjoyed very much being present and hearing Dr. Moren's paper. Fortunately when I was invited to attend this meeting, I was somewhat familiar with Dr. Carmichael's article to which the essayist has referred, and had already become convinced that stramonium was effective in relieving the muscular rigidity and tremor incident to the Parkinsonian syndrome to a certain extent.

Stramonium is apparently not a very mysterious drug. Its active principles are quite well known and belong in the series of atropine alkaloids, in fact there are essentially only two, atropine and hyoscine, hyoscine and scopolamine being chemically identical in every way. Therefore, the action of stramonium is probably due to the combination of these two alkaloids. These two alkaloids, as is well known, have the same effect upon the so-called parasympathetic nervous system, that part of the vegetative system arising from the sacrum, the midbrain and the medulla. Everyone is familiar with the action of atrophine and of hyoscine in drying the secretions, particularly of the salivary glands, paralysis of accommodation which gives blurred vision and dilatation of the pupil. That these two drugs (atropine and hyoscine) differ in their action on the central nervous system is definitely shown by experimental work on animals as well as observations on human beings. Atropine causes marked stimulation of the motor cortex, large doses producing delirium with marked motor restlessness, followed by convulsions, then general depression occurs so far as the cerebrospinal nerves are concerned. Hyoscine (or scopolamine) does not exhibit this stimulating effect on

the motor cortex. It has been shown experimentally that the threshold of the motor cortex under electric stimulation is raised, and it requires a stronger stimulus to cause muscular contraction after the exhibition of scopolamine than it did before. This is quite in line with what is known about the sedative action of the drug on man. There are certain things about the action of stramonium, however, which are not well understood. As Dr. Moren has suggested, atropine and hyosine thus combined may have some potentiating effect on each other. Apparently the depressing effect on the motor cortex is due to the hyosine which is present, but this point has not yet been determined. Solution of the question demands further study of various combinations of atropine with hyosine.

Those of you who are particularly interested in this subject will find much of value in Carmichael's paper to which Dr. Moren has referred.

Wm. E. Gardner: I have enjoyed Dr. Moren's report on the use of stramonium in cases of Parkinsonian syndrome, and the rather comprehensive resume he gave on the work of Shapiro and Carmichael and Green. Dr. Moren made a preliminary report on the use of this drug before the Jefferson County Medical Society a few weeks ago and I was very much interested at the time. Hereafter I shall try stramonium in place of hyosine which I have been using for several years with rather favorable results.

The older works on neurology recommend hyosine in the treatment of the so-called idiopathic Parkinsonism; it was used a number of years ago in various hospitals throughout the country. Therefore, the use of hyosine in the treatment of Parkinsonian syndrome is not new by any means. Dr. Barbour's discussion from a pharmacological standpoint rather argues in favor of hyosine. If it be true that stramonium offers better results from clinical standpoint, and if this is due to the hyosine content, this would indicate that stramonium should be given in large doses. Carmichael and Green do not hesitate to say they have given 20 drops of tincture of stramonium at first, going as high as 90 drops three times daily, the average being 45 to 60 drops thrice daily. I do not believe that 1-100 grain of hyosine three times a day will produce very much effect. In Johns Hopkins Hospital they have carried the dose as high as 1-50 grain four times daily, and I have not hesitated to give hyosine in 1-50 grain doses three or four times a day. There has been marked relaxation of muscular rigidity, improvement in the tremor, and less trouble from salivation. It is probable that salivation is due to rigidity of the throat muscles in Parkinsonism which prevents swallowing and not due to actual increase in the production of saliva. If the patient has muscular rigidity about the throat which prevents swallowing of the saliva, naturally he is going to have constant dribbling.

The pathology of Parkinsonism seems to be in the basal ganglia, the substantia nigra being usually involved. Some observers have claimed that muscular rigidity in many of these cases is possibly due to an exaggerated postural reflex and that stramonium and hyosine seem to overcome this exaggerated tendency. If, however, the rigidity in the Parkinsonian syndrome is due to involvement of the motor cortex, it is probably best not to give stramonium or hyosine in too large doses. By overcoming the postural reflex in such cases, the tendency to rigidity and spasticity might be increased rather than diminished.

Dr. Moren's report has been very interesting, and I shall certainly try stramonium in the treatment of Parkinsonism. I believe the evidence at this time is in favor of this drug, but I would hesitate to give it in large doses at the beginning for fear the hyosine content might produce delirium which sometimes happens even with small doses. It is a fact, however, that a patient with Parkinsonian syndrome will usually tolerate large doses of hyosine, and I have no doubt that much of the improvement in the paralytic manifestations is due to the administration of rather large doses.

Morris Flexner: I am very much interested in the subject about which Dr. Moren has written. Since his first report on the use of stramonium, made before this society in December, 1928, I have been treating a man who has idiopathic Parkinson's disease with this drug. He has been taking two tablets (2 grains each) three times daily or 12 grains a day. He had marked tremor and other typical manifestations of Parkinson's disease. There has undoubtedly been considerable improvement in his condition. One of the most striking things is the improvement in his gait, and I think his mentality is also definitely better. His wife tells me that he is now able to dress and undress himself, something he could not do previously. He is still taking 12 grains stramonium daily, and now complains of a "bad taste" in his mouth, but there is no evidence of dryness of the throat nor visual disturbances. In this case stramonium seems to have had a favorable influence.

J. Rowan Morrison: Dr. Moren has presented a very interesting paper. Since his first report on stramonium I have had no opportunity of giving the drug a trial. I have one patient with Parkinsonian syndrome to whom I have been giving 1-100 grain of hyosine three or four times daily. If improvement does not continue, I will change to stramonium as suggested by Dr. Moren.

Hyosine is a very potent drug. The first dose of hyosine I ever administered was during my internship at the Louisville City Hospital. I gave a man 1-100 grain, he became delirious and tried to jump out of the window. This so impressed me that I feared to give any more hyosine for quite a while. Some time afterward an

elderly man was admitted to the medical ward with Senile Paralysis Agitans with extreme nervousness, tremor and failing health. He was given 1-100 grain hyoscine once daily without any appreciable benefit. I then gave him 1-160 grain twice daily but there was no improvement. The dose was increased until he received 1-50 grain of hyoscine three or four times daily. The effect was remarkable under this dosage, he became calm and was greatly relieved. I have been favorably impressed with hyoscine since that time.

Henry G. Barbour: I should have said in my former remarks that in stramonium we are using something that is not entirely known. We do not know the exact composition of each particular part of stramonium. The beneficial effect of the drug is evidently obtained through its alkaloids. Whether their simultaneous presence is significant we do not know. We should take these separate alkaloids, atropine and hyoscine, and make different mixtures for administration. We would then know exactly what we were doing and a very favorable ratio might be discovered. Stramonium contains $\frac{1}{2}$ of one per cent of the alkaloid atropine, the amount of the more potent constituent, hyoscine, being much less. The average dose of atropine is one minim, that of hyoscine 1-3 that quantity. So you are possibly giving them in equivalent therapeutic amounts when you give stramonium. The future will doubtless replace the use of the crude drug by a therapy based on a definite combination of the two alkaloids which can be crystallized, weighed and given in a known combination. Then the physician will no longer work in the dark.

It has been a great privilege to hear Dr. Moren describe his results.

John J. Moren, (in closing): In closing I want to read to you a letter that has repaid me for the work done in connection with stramonium. Two years ago Dr. C. T. Wolfe and myself had under observation an elderly physician, who had severe headache with periodic attacks of hemiplegia and tremor of the right hand. He lives in another city. In November, 1928, when I began investigating the merits of stramonium, I remembered this physician and wrote him that possibly it might be worth while for him to try stramonium. The following is his letter dated March 17th, 1929: "Received your letter and was certainly glad to get it. It was quite a while before I could get any powdered stramonium leaves. At that time I could not write at all. A considerable part of the time I could not write my name with both hands. I have been waiting until I could write you myself, and you can see what it has done for my palsy. You will remember I was having nearly every day severe pulsating headaches. When I take this powder three times a day I scarcely have any headache at all. It had gotten so luminal and other preparations like that would not give me any relief

at all, and I had headache so I did not sleep, but sleeping good now. Hope to see you some time in the summer."

I wish I could explain the difference, if there is any difference, between the effect of scopolamine, hyoscine and stramonium. Personally I do not look upon hyoscine in the same light Dr. Morrison does. The first man to whom I gave hyoscine had a very severe reaction, and since that time I have not used the drug.

I had under observation one man with paralysis agitans who had been given hyoscine. He was about as miserable an individual as I ever saw. I told him to discontinue hyoscine and begin taking a toddy morning and evening. He followed my advice and felt better.

The results in the cases in which I have used stramonium have been satisfactory. In two young men the results have been splendid, and all the patients suffering from ocular crises have been materially benefited. The drug seems to control this better than it does the other symptoms; but it does relieve the rigidity. It does not influence the tremor to the same extent that it does the rigidity.

AN UNUSUAL CASE OF HEMORRHAGE FOLLOWING TONSILLECTOMY: CASE REPORT*

By KARL N. VICTOR, M. D., Louisville.

I am reporting the following case with the idea of directing attention to the dangers of tonsillectomy, or any other surgical procedure, without more complete laboratory information than is customary. In the case I wish to report, the usual laboratory investigations were made without giving a true index of the patient's condition.

The patient was a female, white, aged 13, somewhat underweight and undernourished, and one of three children. She had the ordinary diseases of childhood without complications, and had suffered frequent attacks of tonsillitis and cervical adenitis since early life. Four years prior to the date of my examination the patient was under treatment for pulmonary tuberculosis, and after two years of treatment was dismissed with the disease apparently arrested. A history was obtained of frequent nosebleed, but little attention was paid to this in the light of later physical findings. With these exceptions the history, both family and personal, was entirely negative.

Tonsillectomy was advised by the family physician after a clinical and roentgen-ray examination had been made and the chest found free of tubercular activity.

Upon examination of the throat the tonsils were found to be follicular in type and the crypts filled with cheesy material. The nasal

*Read before the Jefferson County Medical Society.

septum was thickened and showed ulcerations on both the right and left sides, which, to me, accounted for the history of nasal hemorrhage.

The child was sent to the hospital for operation and the usual routine laboratory examination made. The blood coagulation time was $3\frac{1}{2}$ minutes; the urine was normal. A tonsillectomy was performed under ether anesthesia, using the Sluder technique. The patient left the operating room with the throat dry and in good condition.

One hour following the operation the patient was bleeding profusely from the right tonsillar fossa. Four drams of ceanothyn was given orally and 1-6 grain of morphine sulphate hypodermatically. There were no definite bleeding points in the tonsillar fossa which could be ligated, but rather a "welling up" of blood and oozing from the entire area. After trying several methods to control the bleeding without success, the anterior and posterior pillars were tightly sutured over a sponge saturated with tannic acid crystals. This method was apparently successful. One hour later bleeding again started, from the sutured side as well as from the other, and a considerable amount of blood was lost. The previous dose of ceanothyn was repeated, and again both the right and left anterior and posterior pillars were tightly sutured over tannic acid sponges. The bleeding was again of the papillary type, fairly "welling up" in the fossae as rapidly as it could be sponged away. This procedure seemed to control the bleeding, but due to the excessive loss of blood the patient was in a state of profound shock. The body was cold, clammy, and covered with sweat. The pulse was 160, temperature 97° F., respirations 40 per minute and extremely shallow. 1,500 c. c. of normal saline solution, which was at once introduced by hypodermocentesis, was quickly absorbed. A soda-glucose proctoclysis was started, morphine repeated, the foot of the bed elevated and external heat applied. Ceanothyn drams 4 was ordered every three hours.

The patient reacted promptly. There was no further bleeding. The following day the pulse was 100, respirations 24, temperature 99.8° F. The sutures and sponges were removed without difficulty. An enema was given with good results, much dark brown blood being present in the stool. Fluids by mouth were forced. The next day the patient's temperature, pulse and respirations were normal, and a soft diet was ordered. An uneventful recovery was made.

Two weeks following dismissal of the patient from the hospital a complete blood ex-

amination was made, because the nature of the bleeding was so unlike the usual hemorrhage following tonsillectomy that it was thought some abnormal condition must exist.

The following is the report from the laboratory, and I wish to add that not one but several blood examinations were made.

Coagulation time.....	$3\frac{1}{2}$ minutes
Bleeding time.....	5 minutes
Hemoglobin.....	80 per cent
Erythrocytes	2,560,000
Leukocytes	6,400

Differential:

Polymorphonuclears	61%
Lymphocytes	35%
Eosinophiles	3%
Mononuclears	1%
Blood platelets	76,000

Blood clot retraction test: very slight retraction of the clot.

This blood picture is suggestive of chronic purpura hemorrhagica, and with such a condition present any surgical procedure would have been unwise. Particularly in tonsillectomy a report of the bleeding time as well as the blood coagulation time is most important.

Chronic purpuras are known to exist, often without skin manifestations, especially in tuberculous individuals.

Could these conditions be discovered pre-operatively and complete blood examination be made, the possibility of fatality could be avoided.

This case illustrates the need of a more complete blood examination before any surgical procedure is undertaken.

Bile and Magnesium—The magnesium content of human bile is considerably lower than the calcium content. In an examination of human biliary fistulas and gall-bladders in several cases, the bile of the former was found to contain from 2.25 to 5.5 mg. of magnesium per hundred cubic centimeters, that of the latter between 18 and 65 mg. per hundred cubic centimeters, showing a considerable increase in concentration in the gall-bladder. Magnesium is soluble in water up to about 15 mg. per hundred cubic centimeters. For the bile experiment, the author used powdered bile which contained 30 mg. of magnesium. In a 15 per cent bile powder solution, 91 mg. of magnesium per hundred cubic centimeters went into solution. Magnesium oleate is much more soluble in bile than in water. The bile is a good medium for research in studying the absorption of magnesium salts.

JUVENILE TUBERCULOSIS**

By HENRY D. CHADWICK, M. D.,*
Westfield, Mass.

*Superintendent and Medical Director of the State Sanatorium at Westfield, Mass.

I have been interested in the subject of juvenile tuberculosis for a long time. I became a sanatorium superintendent after taking the cure myself about twenty years ago, and I believe that is really a very good school in which to acquire knowledge. If you want to thoroughly understand the subject, have a little tuberculosis first and then continue with that kind of medical practice. I confess that I was disappointed when I had to give up surgery for tuberculosis, but have since become reconciled to my fate.

Massachusetts built the first state sanatorium in the United States in 1898. Then in 1910, three others were constructed. In none of these institutions was there any provision made for the care of tuberculous children.

To show the change that has taken place in the policy of the State, I need but add that only one of these four sanatoria is now being used for the care of adults with pulmonary tuberculosis. Two of the others, one with three hundred beds and the other with two hundred beds, are devoted entirely to the care of children from three to seventeen years of age. The fourth one is being used for surgical tuberculosis.

You may wonder what has become of the pulmonary cases of tuberculosis of the adult type. They are being cared for in county sanatoria. The State, as a whole, has about 3500 beds for the care of tuberculous patients and has an annual death rate of about 2800, so we have a little more than one bed for each death. That is about the proper proportion that a State needs to properly isolate and care for its tuberculous population.

It is very important that provision has been made for these patients, so that they can be taken out of the community, where they are a source of danger to those with whom they come in contact. If we are to finally eliminate tuberculosis, we must segregate the spreaders of the disease and thus protect children and young adults from frequent infection at the age period when they are especially susceptible.

We have known for a long time that tuberculosis, in its early stage, was curable in a large percentage of cases, and in our effort to find these favorable cases we have reached back to childhood. That is where we find the really incipient stage of tuberculosis. We realize now that most of the cases found in

adult life began years before. They represent the second and third stages of tuberculosis that had its beginning in early life.

In other words, we now know that tuberculosis is a childhood disease, like scarlet fever, measles and pertussis, and that a considerable percentage of children have it. We have been a long time in ascertaining this fact. The reason is that we have been attempting to find it by the old-established standards of diagnosis. We have been looking for the adult type of tuberculosis with its pulmonary changes, which are rarely found in children, and have entirely overlooked the fact that juvenile tuberculosis is a disease of the glandular system and not of the lungs.

We cannot find early tuberculosis as a disease of the lung. We find it as a disease of the lymphatic glands. When infection takes place, either from a human or bovine source, it first affects the lymphatic system. If infection occurs through the tonsils or adenoid tissue, it is manifested by inflammation and induration of the cervical lymph glands. From there the bacilli may be carried into the blood stream, and finally circulate through the lungs, the latter being the filters through which all the blood must pass.

If bacilli are ingested and pass through the walls of the intestinal tract, the mesenteric glands become involved, and the infection finds its way into the larger lymph channels, the blood stream and finally the lungs. The tubercle bacilli may lodge in the air cells of the lung and there produce a primary nodule.

The first visible reaction to infection by the tubercle bacillus in the lungs, whether it reaches there by ingestion or inhalation, is the formation of an exudate, which has the appearance, in the roentgenogram, of bronchopneumonia. The exudate may be quite small or quite large, and if a roentgenogram is made during that particular stage, it will not determine whether the disease is bronchopneumonia or tuberculosis, as the pictures look alike, but, of course, the symptoms that accompany the condition are different. In bronchopneumonia, we have an acute disease, high fever, and the roentgenogram may show a small area of exudate, while in primary tuberculous invasion of the lung, the exudate which follows may be considerable, but there is very little elevation of temperature.

High fever is not a characteristic of tuberculosis in children. Temperature, the result of tuberculosis, is of a low grade. If there is high fever in pulmonary tuberculosis, it is due to a secondary infection and not to the reaction of the tubercle bacillus. It must be remembered that in bronchopneumonia, we have an acute disease, while in tuberculosis the condition is essentially chronic.

Now what follows after that? The next step

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is absorption of the exudate—that exudate leaves behind it a nodule—that nodule may be too small for us to see—it may be microscopic in size or it may be large enough to be plainly visible in the roentgenogram.

We must keep in mind that the lymph circulation is always toward the center of the lung. Then we will always understand why bacilli, that may lodge in any part of the pulmonary tissue, will eventually be carried to the lymph nodes at the root of the lung. Many lymphatic glands are situated about the trachea and the larger bronchi.

The lymphatics of the lung are of two kinds; the superficial and the deep. The superficial system is just beneath the pleura, and the lymph first flows toward the periphery of the lung. From the deeper lung structure, the lymph flows toward the hilum. The efferent branches of this superficial or pleural system anastomose with the deeper system, the main trunks of which carry all the lymph drainage of the lungs to the tracheobronchial glands in the mediastinum. It follows, therefore, that when tubercle bacilli reach the lungs by either the air or the blood route, they will eventually be carried to the lymph nodes at the hilum and there produce disease. A primary tubercle in the lung is very soon followed by tuberculous bronchial glands.

What are the symptoms of the juvenile type of tuberculosis? They are very ill-defined. The most important and frequent are—That such children tire easily; they cannot keep pace with their playmates; they are unable to do satisfactory school work; they are listless and inattentive and cannot concentrate on their work; they are prone to sit around instead of taking an active part in play, or if they do, they maintain their interest only a short time.

A child may, or may not, be underweight. In young children we find the juvenile type of tuberculosis about as frequently as those of average weight or overweight, as in those that are malnourished. They are apt to be nervous children. They may have frequent colds. These symptoms that I have mentioned are not alone found in tuberculosis. They occur in many other infections.

We have no symptoms, therefore, that are characteristic of juvenile tuberculosis. The history of contact is most important. If the child is known to have been exposed to an open case of tuberculosis, we can be almost certain that that child has been infected. The tuberculin test will determine infection, but to find whether disease has actually developed, we have to go further with our study of the case.

What are the physical signs that one may expect to find in a child that has tuberculosis of the juvenile type? In pulmonary tuber-

culosis of the adult type, we expect to find rales, other changes in the breath sounds and impaired resonance at the top of the lung, but these signs are not present in the juvenile type, because the lung tissue itself is not involved.

We do not find rales, because there is no moisture in the air cells to cause them. We find no change in the percussion note, because there is but little consolidation of the lung tissue. The glands that are enlarged in disease of this type are situated too deeply at the lung root to cause any change in the percussion note, because of increased size or density. There are some cases in which we find a dull percussion note in the interscapular region, but this is probably due to a reflex muscular spasm caused by the glandular inflammation. As a rule, the physical signs are negative.

The most important diagnostic factors in these cases are the tuberculin test and the roentgenogram. The diagnosis of juvenile tuberculosis must be made by the X-Ray. It cannot be made by physical examination. The tuberculin test is very essential, either cutaneous or intradermal, because by that means we can determine whether infection is present. Then if the roentgenogram shows enlarged tracheobronchial glands or nodules in the lung, we may be very certain that the child has the juvenile type of tuberculosis.

Calcium is soon deposited in tuberculous tissue and that makes the diseased glands easy to recognize in the X-Ray film. I want to emphasize the point that we cannot make a diagnosis of juvenile tuberculosis with the stethoscope or by percussion. We are not justified in giving an opinion that a child has not tuberculosis until we have made the tuberculin test, and if the reaction is positive, X-Rayed the chest and find no evidence of disease in the film.

I feel confident that pulmonary tuberculosis can be prevented from developing in later life if we find the children when the disease is confined to the glands, and then giving them close supervision, more sunshine, more rest and proper food. One thing these children particularly need is more rest. Our sanatorium routine is to give them half an hour bed-rest before dinner, half an hour bed-rest before supper and two hours' bed-rest after dinner. They spend but two and a half hours a day in school. They play always under supervision to see that they do not do any one thing too long at a time. We try to restrict their expenditure of energy.

It is sometimes difficult to make a child gain in weight, regardless of the fact that he is getting the proper food, unless we limit his activities. If our children do not gain weight under our routine, we give them more rest, instead of more food. They cannot take more

food to advantage, because they are already getting all they can assimilate, so we put them to bed and keep them there until they begin to gain weight.

The prognosis in juvenile tuberculosis is very good. Our children remain in the sanatorium about a year on the average. Some are dismissed in three months, some remain several years. Children with juvenile tuberculosis get well, become strong and feel and act like normal children. That is our guide in determining when they are well enough to be discharged. We cannot determine from the roentgenogram when the child is well of tuberculosis, because the calcified glands remain throughout life.

The Massachusetts Department of Public Health is carrying on a Ten-Year Program for the examination of the school children of the State. We are now on the fifth year of this work. About 25,000 children are examined each year. Our Clinic Unit consists of seventeen persons, made up of doctors, nurses, stenographers, nutritionists and an X-Ray technician.

The physical examinations are made in the schools. A Pirquet tuberculin test is done on each child. The positive reactors have averaged 28% and these are all X-Rayed. These chest films are considered in connection with the history of the case taken by the nurse, the physical examination made by the doctor and the tuberculin test. The children are classified, after giving consideration to all those factors.

1½% are found to have the hilum or juvenile type of tuberculosis, and 3½% are found to be suspects. Rarely a case of pulmonary tuberculosis of the adult type is found in a school child. These are excluded from school, as they are a menace to other children, and they need sanatorium treatment. The hilum cases are not spreaders of bacilli, and they may continue to remain in school if home conditions are favorable. Otherwise, they should be sent to a sanatorium. The reports on these children, giving the classification and a list of the defects noted by the examiner, are sent to the parents, who are requested to take them to their physician for advice and treatment.

Our clinic is purely a diagnostic one. No treatment is given. Annually thereafter, during the school life of the child, the positive and suspicious cases are re-examined and records kept as to their condition as compared with previous years.

Aside from the purely anti-tuberculosis aspect of this clinic work, we are able to list the children with defective teeth, enlarged or diseased tonsils, goitre, and those with abnormal heart murmurs. The School and Public

Health Nurses are given a list of the children who require treatment, and their duty is to urge the parents to carry out the advice that has been given.

The lantern slides of chest films and graphs I am to show you will demonstrate the tuberculous lesions found in these children, and the percentage of infected and diseased children as we have found them in our work.

SUMMARY

Primary or juvenile tuberculosis is a disease of the tracheobronchial glands. It is found in 1½% of school children.

3½% more are considered as suspicious cases. These children have some of the signs and symptoms, but not enough to warrant a positive diagnosis. They should be watched and the presence or absence of tuberculosis determined by subsequent examinations.

Pulmonary tuberculosis of the adult type is rarely found in school children below the high school age—about one in three thousand examined.

In addition to these classes, we find 7% who have marked malnutrition and require advice and supervision to overcome that condition.

1% have heart murmurs that may, or may not, be due to organic disease. These children should be studied further and supervised.

27% were found to have diseased or enlarged tonsils, and about 50% are in need of dentistry.

We feel certain that public health work of this kind is bound to result in better general health and a lowering of the death rate from tuberculosis in the years to come. The program is an effort to lessen the deaths from tuberculosis in the period of adolescence and young adult life.

To prevent further infection and increase resistance are the two weapons in our hands with which to accomplish this result. We must first find the children that are in greatest danger and give them aid while they are getting adjusted to their tuberculous infection.

The death rate from all forms of tuberculosis in Massachusetts in 1918 was 157 per 100,000. In 1927 it had been reduced to 74 per 100,000. Now the State has more than one bed for each death available for the hospitalization of tuberculous patients. This important factor, together with the intensive work being done with the school children and also with all other public health activities, should result in a more rapid lowering of the death rate in the years to come.

POSTPARTUM CARE*

By SILAS H. STARR, M. D., Louisville.

Postpartum care is a subject that has been receiving all to little attention from the practitioner, and until recently, from the specialist as well. It can be practiced just as effectively by one as the other and should be considered an integral part of the care of the women who bear children. It is in comparatively recent years that, after a woman registered for a confinement, the physician merely recorded her formally, and saw her professionally when her labor began. Recently prenatal care has been introduced, educating the public as well as the profession so that remarkable results have been attained in lessening the complications of pregnancy and labor. Postpartum care, on the other hand, is practiced by a mere handful. The practitioner as a rule has not stressed this care and after the immediate lying-in period, the patients seem unaware of the value that it possesses in the field of preventive medicine. By prenatal care we can lessen toxemia, prevent eclampsia, prepare the patient for normal labor by diet, exercise, and elimination; by intelligent postpartum care we should also prevent many complications—mastitis, breast abscess, subinvolution, erosions of the cervix, endocervicitis, mal-position of the uterus and even perhaps cervical carcinoma, for we know that most cervical carcinomata are based upon old lacerated, eroded cervices. Polak states that 60% of women's diseases are due to obstetrics. Obstetrics includes prenatal and postpartum care as well as parturition, and surely this large percentage can be reduced by intelligent treatment after delivery.

The functions of obstetrics are, after Polak:

1. To deliver the woman of a living child with minimum injury to her general system and to her local soft parts.

2. To leave her in such physical condition that she may be an economic asset to her family and to her community; namely, assume charge of her child, nurse it, and attend to her household and social duties.

The following is a general routine for postpartum care with a discussion of a few mooted points. It is to a large extent the routine we practice in the Louisville City Hospital.

As soon as the placenta is expelled the uterus should be palpated, and if not well contracted it should be massaged gently until contraction occurs and bleeding stops. Pituitrin $\frac{1}{2}$ to 1 c. c. may be given or fluid extract of ergot 1 dram, or both. If, however, the uterus is atonic, let us remember that our best oxytocic is massage followed by the drugs. In order to safe guard the patient it is well to

give pituitrin and ergot after all operative cases, after overdistension, after uterine inertia, and after abnormally long labors. In all cases the fundus should be watched if not actually held for an hour. If it is well contracted after that time, it will probably remain so. At this time the soiled linen should be changed, blood removed from the patient, and a sterile vulval pad applied. The patient should be kept warm and as comfortable as possible at this time.

An abdominal binder may be applied, but this is not nearly so important as generally supposed. It serves merely as a comfort to the patient when she turns from side to side and does not aid in contraction and involution. I think it should be applied loosely enough for the attendant to palpate the uterus underneath. As soon as the patient is comfortable without it, it should be removed.

When the patient is put to bed she may be given a warm drink if not nauseated, and encouraged to sleep. This may be considered the end of the first postpartum stage.

The second stage constitutes the next two weeks, and various symptoms and conditions arise, which can be treated in various ways.

After pains: These pains, which occur most frequently in multiparae, are due to the alternate contraction and relaxation of the uterus. Clots frequently may be expressed and relief be secured. Ergot, dram, 1, three times a day for the first three days tends to cause contraction and is a prophylactic remedy. Ordinarily a mild sedative of codeine and aspirin affords relief.

Lochia: The first three days the lochia is red, then gradually becomes pale and finally almost white. If a bloody discharge persists ten days or two weeks it usually indicates the retention of some decidual products. The lochia has a characteristic odor. Foul lochia indicates retention products which have undergone putrefaction. The vulval pads should be changed as often as necessary, always after urination and defecation. At this time a pitcher douche should be given of 1% lysol, sterile water, or any mild antiseptic. The point to be remembered is that we want free drainage and the vulva should be treated as an open wound.

Fundus: The fundus normally is at the umbilicus or one finger below immediately after the third stage. It gradually diminishes in size until by the tenth day it should be below the pelvic brim. The chief cause of subinvolution or high fundus is poor drainage or poor circulation. To increase drainage the head of the bed must be elevated and the position of the patient may be frequently changed, having her lie on her abdomen and her sides. An ice cap may be put on the abdomen to aid contraction; the intestine and urinary

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bladder should be empty. Hot enemata may increase the pelvic circulation as well as empty the intestine. A mixture with ergot and quinine may be given to promote contraction.

Diet: Usually the patient is not sick and she may eat, but let us remember that she is in bed and does not need as much food as an active person. The first day she may have fluids, toast, custard and soft eggs, and gradually this may be increased until she may resume her normal diet after three days after a good intestinal movement. Let me emphasize that a bed-patient does not require as much food as one who is active.

Urination: The patient should be encouraged to urinate six or eight hours after delivery, if she hasn't already voided. Many times it is difficult for patients to urinate because of trauma around the urethra, and some have difficulty in using the bed pan. A vesical cavity not only causes discomfort per se, but also retards involution of the uterus and drainage of lochia. Catheterization is the mode of last resort to empty the viscus because of the danger of infection. Encourage the patient to urinate by placing her on a steaming bed pan, pour warm water over the vulva, let her hear running water, place a hot water bag over the vesical region, support patient's back and let her sit up, and give a glycerine enema. Very seldom it is that we do not obtain the desired result in this way. At times a patient is apparently urinating all right, but she appears to be distended. She may be voiding only the overflow, and there may remain a great deal of urine in the vesical cavity.

A "full bladder" seems to cause more difficulty in diagnosis for students and internes than almost any puerperal condition. Whenever the uterus is out of the mid-line, when it is too high or when the patient is very uncomfortable and tender over the symphysis, it should be suspected.

Intestine: Usually the patient is constipated early in the puerperium due to the small amount of food eaten, the relaxed abdomen, lack of exercise, and her unnatural position. It is a time-honored custom to give castor oil the morning of the third day. A more pleasant cathartic is welcomed by the patient usually and she is grateful to receive licorice powder, pills or almost anything but castor oil. If the cathartic is not effective, good results are obtained with an enema. After the first movement if defecation does not occur daily a laxative is usually effective.

McPherson, in 1917, observed a series of cases where castor oil was given and another in which enemata were used entirely during the time the patient was in bed. In 322 cases given oil, 28 had fever and in the same num-

ber without oil only 3 had fever. I believe that in any case with signs of pelvic inflammation, a strong cathartic is contraindicated. McPherson pleads for individualization.

Nipples: The nipples should be left entirely alone by the patient. In some hospitals they are washed continually before nursing with boric acid and a sterile dressing kept on them. The chief point is that they should be kept clean. If there are any abrasions, compound tincture of benzoin or bismuth and castor oil, or one of any number of remedies may be used as a dressing. This should be removed by washing before the baby nurses. The nipple shield should be used. If severe the baby should be taken off the breast and the nipple given a chance to heal. This is one condition where I think the breast pump is valuable.

Breasts: The milk usually appears on the third day. At this time the breasts become swollen and tender, but are usually all right in a day. When the breasts are pendulous a supporting binder aids a great deal to the patient's comfort. When the baby is dead, we deal with the problem of what to do with the breasts. Williams recommends leaving them alone and giving the patient a sedative and says that the engorgement will disappear in a day. A supporting binder usually affords relief in this case also. A saline cathartic, magnesium sulphate or citrate of magnesia and limiting fluids will usually aid in decreasing the secretion of milk. Do not pump the breasts as this stimulates the secretion. Strapping the breasts with adhesive can be used in place of a binder. It is less likely to loosen and does not have to be removed.

Nursing: Six hours after birth, the baby may be put to breast for five minutes, and this continued every four hours increasing 5 minutes each day until he has nursed for twenty minutes. Nursing the baby early stimulates the secretion of milk, teaches the baby to nurse, and the colostrum acts as a laxative.

Visitors: Visitors as a rule should be allowed after the mother has had some sleep following delivery. At first only one or two should be allowed and only members of the immediate family.

Time to get up: This to me is a matter of individualization. After ten days the uterus should have descended to the pelvis. If this is so it is time to get up if the temperature, pulse and respirations are normal; the first day an hour, then two and gradually the entire day, resting perhaps in the early afternoon.

As early as 1773 White advocated rising as early as the third day, and advocacy of early rising has appeared in articles occasionally since that time. It seems to me that it requires at least ten days for the ligaments

and supporting muscles to regain their tone and for the uterus to decrease in weight so that it will not be on such a strain.

Exercise: At the Long Island College Hospital, the patient is instructed to take leg exercises as early as the fifth day, and by the time she gets up there is regular calsthenic course. When up the patients do the knee-chest position, and the "monkey walk." The reasons for these exercises is to strengthen the abdominal muscles and aid involution of the uterus. Usually without such a complicated set of exercises we are able to obtain equally good results. However, carrying out extreme measures of exercise is much better than to neglect exercise.

Slowly rising from the back to the sitting position aids in strengthening the abdominal muscles. The patient should be encouraged immediately to change position in bed and to lie on her abdomen frequently. This is difficult before the fifth or sixth day because of engorgement of the breasts. The knee-chest position may be begun after the first week and continued twice a day until the final dismissal of the patient, six weeks postpartum or longer if the uterus is subinvolved.

Hot mildly astringent douches should be given after the second week. In the first place there is a cervical secretion which persists and if we do not use cleansing measures we invite infection. The heat stimulates circulation and aids involution. An astringent is valuable in mild erosions, and if the douches are taken faithfully from the second to the sixth week along with knee-chest position, there is little pathology at the end of that period.

At the end of six weeks if the uterus is retroverted, it should be replaced and a pessary inserted. Watson recommends this as early as the second or third week.

Two more points might be mentioned. Laceration of the perineum should be repaired immediately.

As for cervical lacerations, if each patient was in a hospital under the care of a good operator this might also be recommended, but repairing a cervix is a comparatively difficult procedure. In the City Hospital we repair the cervix immediately, only because of hemorrhage. Others examine and repair it routinely. Watson takes the middle ground and recommends examination of the cervix after tumultuous labors, and after forceps and version before complete dilatation, repairing the deep tears.

Finally we may say that in managing the puerperium, we care for the mother as carefully as we did before and during labor and guard against several factors.

1. Hemorrhage, by proper treatment of the uterus by massage, pituitrin and ergot,

and by the repair of lacerations.

2. Infection, by repair of lacerations, by treating the vulva and vagina under aseptic precautions and keeping cleanliness foremost in mind.

3. Subinvolution and displacement of uterus, by proper elimination, rest and exercise.

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DISCUSSION

Edward Speidel: Dr. Starr has given us a very interesting and up-to-date paper on postpartum care for hospitalized patients. In private practice of course some additional requirements are necessary. I think stress should be placed upon the danger of moving the patient unnecessarily immediately after delivery. If she is moved too early and the uterus is not supported, death from air embolus may occur. This does not happen very often, but when it does occur it is a dire calamity, consequently great care should be taken in moving the patient immediately after delivery. If she has to be moved the uterus should be firmly supported. The dorsal position in bed should be maintained for the first few days, then the patient should be encouraged to lie on either side or if possible on the abdomen. I think we should pay greater attention to the posture of the patient for the first few days after delivery. The head rest is often of advantage in promoting comfort. After the fifth day leg and arm exercises are begun, and a day or two later the patient is placed in the knee-chest position for ten minutes twice daily. This is done for the two weeks longer she remains in the hospital and continued for one week after she returns home.

After the first day, if there are no definite contraindications to this procedure, I allow the patient to be taken out of bed for both micturition and defecation. There are several reasons for this. First, the majority of people can perform these functions more readily in the natural position. Second, by taking the patient out of bed in this manner the lochia can drain from the upper part of the vagina, stagnation of the lochia will not occur and foul odor is avoided.

I am opposed to the giving of vaginal douches

in the early part of the lying-in period for the reason that when a vaginal douche is given the patient is elevated on the bed-pan and the first part of the douche is likely to force some of the foul lochia into the uterine cavity and may involve infection. Consequently I think it is better to secure drainage by altering the position of the patient and omit vaginal douches until later.

It is important in all cases to determine whether the urinary bladder is evacuated or not. On two occasions I have been called in consultation, and reported one of the cases, where the patient had a large abdominal tumor extending upward to the umbilicus. Examination showed the tumor to be a distended urinary bladder, and 130 ounces of urine was withdrawn by catheter.

I have added to my postpartum treatment of late the administration of ergot three times daily for the first two days. If any manipulation has been performed, especially intrauterine manipulation, in order to avoid any possibility of puerperal infection the administration of ergot is continued for at least five days. In that way if any infection has entered the uterus it remains localized and can be controlled.

Finally I want to object to the plan of allowing relatives and friends to visit the patient too early after confinement. I have recently had two difficult labor cases, occipito posterior positions in which manual rotation and forceps delivery became necessary. Under such circumstances the patient is exhausted and it generally becomes necessary to manually remove the placenta. Both mothers and babies were saved. On my next visit to one of these patients, only 20 hours after delivery, I found two visitors sitting on the bed and five or six others in the room. I then lost my temper and had a plain talk with the mother of the young woman I had just delivered. I reminded her when she had her babies it was the custom to allow no visitors in the room until the tenth day postpartum. Your daughter has had a difficult labor and yet she is allowed to have visitors before the second day.

If I could restrict visitors until after the tenth day postpartum I would be glad to do it, and I believe the time is coming when this will have to be done.

W. T. McConnell: I am glad Dr. Starr selected the subject of postpartum care for his paper. As he said, there has recently been a great deal of discussion about prenatal care, but we have heard little about postpartum care. The latter is important as well as the former. Postpartum care, as indicated in the paper, should be looked upon from two main aspects: The first is to give the woman a safe and comfortable lying-in period; second, to prevent as far as possible the development of complications after the patient leaves the lying-in chamber. By devoting greater attention to postpartum care, I believe

we could avoid many distressing conditions so frequently seen in the practice of gynecology.

It has been the custom, not only in rural districts but in many instances in cities as well, for the doctor to consider his work finished when the baby is born and he receives the great (?) reward of \$25.00 for his services, and very often he never returns to see his patient; he does not worry about her postpartum care. If complications develop the physician may be called. These conditions, in my opinion, are largely due to two factors, namely, the lack of appreciation, on part of the doctor, of the dangers that lurk in the wake of child bearing; and the system of remuneration that has been in vogue. Physicians have told me that they made an extra charge for every visit after the baby was born. The patient figures that so long as she feels well why go the extra expense of having the doctor call again? Conditions would improve if doctors did this work on a contract basis.

Dr. Starr has given us a very practical, and, I think, workable outline of postpartum care. There are a few things I would like to emphasize. One is the time the patient should be allowed to get up to the commode after delivery. Unless the laceration is very severe, I believe the patient can safely get up after the first day to urinate and defecate. This is important for the reasons stated by Dr. Speldel. Personally I think postural treatment exerts a very favorable influence upon the uterus. It takes the pressure of the abdominal organs temporarily off from the pelvic contents and permits congestion to be relieved promptly and effectually; it also permits the uterus and adnexa to assume their normal position. Frequently a retroversion may be corrected by the use of a properly fitting pessary for a short time, beginning some six weeks after delivery. The knee-chest position should be started as soon as the lochia changes from sanguineous to serious in character. As to repairing the lacerated cervix immediately after delivery, I think that should depend upon conditions observed at this time. If the dilatation has been normal and physiological, the internal os retracting as it should, there is very little chance of severe laceration. If however, the dilatation has not been satisfactory or forceps have been used before the head is completely out of the cervix, then an investigation should be made and immediate repair instituted as indicated. If there is a severe bleeding immediately after delivery with the uterus contracted it practically always means an extensive laceration, and the bleeding point should be located and repair made.

Adequate repair of the perineum should always be done immediately unless the patient's condition prevents further anesthetic.

Simrall Anderson: As to repairing the lacerated cervix immediately after delivery I believe it impossible to determine the extent of the

tear. Viewed through a speculum the whole cervix appears involved. If there is hemorrhage from same I believe sutures should be inserted to control bleeding. Of course every perineal tear should be repaired immediately.

On several occasions I have successfully closed perineal lacerations months after delivery where the patients had been previously operated upon with unsatisfactory results. In these cases the lacerations extended into the rectum and as soon as a bowel movement was obtained the entire repair immediately broke loose. The only way to successfully handle such cases is to keep the patient from having an alvine evacuation for a considerable length of time. I recall one such patient who had been operated upon three times before she came under my observation. When I operated upon her, the intestinal canal was thoroughly cleansed before hand, and she was kept from defecating for twelve days. The rectal sphincter was united and perincerrhaphy performed. Closure was perfect and rectal control was restored. At the end of twelve days she was given oil injections by rectum and castor oil by mouth, producing a satisfactory evacuation. The only way we can succeed in cases where the perineal laceration extends into the rectum is to prevent fecal evacuations for a sufficient time to allow the tissues to heal thoroughly. I believe this is the secret in securing successful results as was done in this case.

H. B. Scott: We often hear papers on various subjects read before medical societies in which one or more important points are omitted. The essayist gave us a very interesting paper on postpartum care but failed to mention postpartum psychoses. Fortunately such cases are infrequent, but we have seen quite a number of them. The larger percentage of the patients we have seen with postpartum psychoses were from rural districts; they had received no antepartum and very little postpartum care. Every woman after childbirth should be closely followed for some time by the general practitioner or obstetrician. A postpartum psychoses may develop at any time after delivery, from a week to several months. Some of our patients have been brought in three to six months after childbirth. There is no question but we must attribute the mental state of these patients to something which has occurred before delivery or more likely afterward. It may be partially due to shock, or to loss of blood with resulting cerebral anemia. If these patients are seen early, thoroughly eliminated, adequately nourished, given proper sedatives and rest, favorable results may be expected in at least 90 per cent of cases. Such results cannot be obtained, however, after true mania has developed.

Obstetricians and general practitioners should not overlook the fact that postpartum psychoses may develop in any case and the patient should

be kept under observation for a considerable period of time. To be successful treatment must be applied early.

Silas H. Starr, (in closing): I thank the gentlemen for their discussion. There is only one point I wish to emphasize in closing, and that is the question of vaginal douches after the first two weeks postpartum. In the postpartum clinic of Bellevue Hospital, New York, we noticed that in about 80 per cent of those returning for observation five or six weeks after delivery in patients taking knee-chest position and douches, the uterus was normal in size and position, but there were some eroded cervixes. In none of these cases was there any serious trouble. In the hospital, douches are always given with the patient in the recumbent position with the hips elevated. We found that after leaving the hospital these patients had been taking douches in the standing position. This was probably the reason cervical erosions had persisted. When vaginal douches are to be used after the patient is dismissed from hospital, she should be thoroughly instructed how to take them if the best results are to be secured.

THE PRESENT STATUS OF THE MALARIAL INOCULATION IN THE TREATMENT OF PARESIS*

By H. B. SCOTT, M. D., Louisville.

In the year of 1887, Wagner Von Jauregg found that paretics had a tendency to temporarily improve following intercurrent infectious diseases and suppurative processes. This discovery suggested the advisability of deliberately attacking the problem with a controllable fever-producing element. In the earlier attempts tuberculin and mercury were used with encouraging results; later typhoid vaccine was tried and found to yield somewhat better and more lasting results than tuberculin; but all this inspired the hope that an acute infectious fever might prove more effective, so the tertian type of malaria, since it can be definitely controlled, was selected for the purpose.

In 1917 Wagner Von Jauregg treated nine patients having paresis by this method, six of the nine were benefitted, and in 1922, four years after treatment, three of these were actively and efficiently at work. This result stimulated him to use the method continuously and it was subsequently reported that over two hundred patients had been treated with the result that more than fifty were in complete remissions, which included cases not only of beginning dementia but also states of severe maniacal excitement with delusions of grandeur and delirious reactions. Other European investigators were not slow to follow his lead, so at present there are some forty deal-

*Read before the Jefferson County Medical Society.

ing with different aspects of the question. Among the early favorable reports were those of Delgado of Peru, of Nonne of Hamburg, Pilez and Gerstmann of Vienna.

Wagner Von Jauregg made other announcements in 1918, 1921 and 1922. His technique consisted in inoculating the patient intramuscularly with 2 c. c.'s. of blood from an acutely malarial-benign tertian-type-nonsyphilitic individuals. Chills and fever occurred after eight to ten days incubation and were generally permitted to continue from twelve to sixteen paroxysms, which were then interrupted by active quinine therapy. In 1923, Kirschbaum reported a series of 196 cases of general paralysis treated with the malarial inoculation; of these, 123 patients, or 63%, had remissions of varying degrees; 61 (31%) were classed as having complete remissions; 42 (21%) as having fairly complete remissions; and 20 (11%) as having slight remissions; 45 were unimproved; 28 died and 10 relapsed after having a good remission. The treatment of general paralysis by means of malarial inoculation is based on no known principle and is of a purely empiric nature; the mode of action of intercurrent suppurative or febrile conditions in bringing about a degree of clinical improvement in a certain number of cases, not only of general paresis but also of postencephalitic conditions, and occasionally of other disorders of the central nervous system, is quite unknown. It has been suggested that the phenomenon is due to an influence of biologic order; that malaria, for example, calls forth the production of antibodies, or other substances, which act with some effectiveness against the original *causa morbi*; but the purely speculative character of this suggestion is obvious. Some think that the high degree of fever produced, especially by the malaria, is a factor, if not solely responsible for the favorable effect exerted by the intercurrent infection.

Against this supposition lies the fact, at least in the case of general paralysis, that the thermal death of the spirochete is 56 centigrade continued for ten minutes, although it is stated that the organism fails to grow at temperatures in excess of from 40 to 41 centigrade. (104 to 105 Fahrenheit). On the other hand, it is possible that the experiments of Weichbrodt and Jahnel have some bearing on the matter, for these investigators found that the complete disappearance and death of spirochetes present in scrotal chancres in rabbits could be brought about by the exposure of animals so infected, provided such exposures were repeated not less than three times. It likewise appears somewhat suggestive that Wagner Von Jauregg obtained what would seem to have been progressively better results in the treatment of paresis as he em-

ployed increasingly effective febrifacients.

There are several theories which attempt to explain the manner in which the malaria exerts its influence upon the spirochete. We know that there is no specific reaction, otherwise, several other infectious diseases and fevers would not produce similar results. Good remissions have occurred in cases having only a slight rise in temperature, therefore, the fever alone is not responsible for results. Mueller believes that changes in the vascular tonus occur in various parts of the body following injections, that parasympathetic reactions such as vaso-dilatation occur, thus leading to local hyperemia and transudation, which reactions are accompanied by invasions of polymorphonuclear leucocytes and escape of serum. Thus, the general leucocyte count of the circulation is lowered and the blood pressure falls. This general leukopenia in the peripheral stream indicates a shunting of current and cells into the abdominal vessels which are dilated by parasympathetic impulses, which the abdominal vasodilation is easily and quickly neutralized by the unimpaired vasoconstrictors, the same dilatation in the local inflammatory areas in the brain is of longer standing and leads to the above described reactions. This suggests an effect on the vegetative vasomotor system independent of temperature rises, yet dependent upon malaria.

Some believe that we should take advantage of this increased transudate process by following with the usual specific therapy in order that a more intimate contact with spirochetes may be had.

Many writers have remarked on the atypical and irregular course often noted in inoculation malaria. Our experience has been the same, in fact most all of our cases have presented irregular courses of fever. The attacks of chills and fever rarely take place only every other day, far more frequently they are from the first, or soon become, diurnal in occurrence, sometimes three or four days between febrile attacks. Some cases were mostly subnormal and then the infection apparently subsided without quinine therapy. Some writers report serious complications, but are considered rare by most all the writers, and so far, we have experienced none. One patient had convulsions but this patient had been having them previously so they were of no significance. The serological findings do not at all agree with the clinical results. A patient who has experienced a complete remission will show a positive blood, partially modified and also a somewhat modified improved spinal fluid, although some cases have been reported which show a certain degree of correlation between the clinical and serological improvement. This is the reason it is

necessary to follow quinine therapy with courses of salvarsan and mercury, and in course of time the blood and spinal fluid become negative. There is no question but the results obtained depend essentially on the stage of the disease, and the earlier the more certain the remission. In these early cases, successful results can be predicted with almost absolute certainty. Gerstmann believes that the types giving the best results are simple dementia and taboparesis. Pilcz adds cases of maniacal excitement to this group.

The development of acute mental symptoms during the febrile stage is regarded as favorable, though they occasionally persist after the cessation of fever. This is true especially of auditory hallucinations which may continue in spite of an otherwise complete remission. Many patients are soon restored so that they are able to work at something and have a complete insight into their condition and also have very good judgment. Pupils usually improve but rarely show a complete restoration of the reflex to light; speech disturbances and writing improve. Pyramidal tract disorders greatly improve. One writer reports that twenty patients were given the inoculation the second time, seventeen months after the first inoculation had failed. Mosquito infection was found more effective in producing the second attack, as it is generally conceded very difficult to inoculate the second time; eight months observation show: one patient dead, seven unimproved, seven slightly improved, two have made a marked progress, three have been discharged. In view of the fact that these patients showed little or no improvement after the first inoculation and twelve of the twenty showed improvement on re-inoculation, it seems worth while to renew malarial treatment in suitable cases of paresis.

Taking everything into consideration, one must admit that the results obtained so far are decidedly better and greater than any other treatment for paresis. Sufficient time has not elapsed to fully determine the degree of permanency or the exact nature of the remission.

That the results thus far obtained have been somewhat uniform and suggest that there is enough constancy in the remission and results to follow this treatment persistently and conscientiously.

The advocates of the specific and the non-specific treatment of neurosyphilis are not engaged in controversy. The arsphenamines, bismuth, tryparsamide, malaria and typhoid vaccine each has a definite field in which it produces the maximum good. Years of experience in a large series of cases in this country and Europe have demonstrated beyond doubt the value of these various remedies. The task now awaiting the syphilologist

is to develop criteria to enable him to determine with a fair degree of certainty the cases in which the special remedies are best suited. Tryparsamide or arsphenamine with intraspinal measures and bismuth or mercury, is definitely indicated following fever therapy, in spite of the fact that in a few cases in which specific therapy following the fever-course was refused, the clinical and serologic results were excellent.

The mortality in cases treated by malaria as reported by various observers, has not offered a weighty weapon for opponents of this form of treatment. Of the first one hundred patients treated by this method, nine are dead, a rate which compared favorably with that in any group of untreated cases of parenchymatous neurosyphilis observed for three years. Analysis of the causes of death shows that in two cases it was probably directly due to the malaria. In three others, the malaria undoubtedly acted as the predisposing factor, as the direct causes were bronchopneumonia, diphtheria and erysipelas. These infections were acquired shortly after the malaria was stopped or during the last few days of the fever-course when the patients were debilitated and exhausted. In two cases, death was caused by general paralytic convulsions many months after the fever-course; in these, it seems, the malaria had no influence. So there have been only five cases in which death was influenced by the malaria, a surprisingly low figure, if the severity of the fever-course and the debility of the patient are considered in cases that are not selected especially for inoculation.

There has been very little change from the original technique; 2 c. c's. of blood is sufficient. The inoculation may be intramuscularly or intravenously. The chills occur after eight to ten days of incubation but usually somewhat sooner when it is given intravenously and from twelve to fifteen paroxysms are permitted which are then interrupted by active quinine therapy. It is well to state at this point that inoculation-malaria is not transmissible by mosquitoes. The observation that sexual forms (gametes) were almost entirely absent from the blood of inoculated patients, was the starting point of several experiments. Inoculated malarial patients were exposed to anopheles bites and attempts were made to transfer the disease to others in this manner. Results were negative, although the susceptibility of these subjects was demonstrated through subsequent injection of malarial blood. From such experiments several authors have concluded that the malarial treatment of paresis entails no danger of spreading the malaria by this means. It was also demonstrated in a series of 20 cases that the malarial plas-

modium becomes more virulent as it is incubated and transferred to the next patient. In this instance 20 inoculation injections were made and the intensity of the fever gradually ascended as the progression increased.

CASE REPORTS

In February, 1928, Dr. Curran Pope and myself inoculated five cases of general paralysis at Beechhurst Sanitarium. Case 1 did not develop any fever; Case 2 ran a subnormal course. Cases 3 and 4 ran the usual fever-course; Case 5 died in October and ran a similar course that I have seen where no treatment was administered. Case 3 shows a slight improvement; Case 2 made a complete remission and is now practicing his profession. The remaining one, Case 1, is in a state of dementia and is just about the same condition that he was before the treatment was given. Since the Medical School term opened in September, we have inoculated four cases at the City Hospital, two males and two females. One female is quiet and shows slight improvement. One male shows some improvement. The others are no better. Three patients are at present having fever; one female, who is in her home at present, and two others, who are at the City Hospital, have just been inoculated.

One patient, (F. A. P., white) after being inoculated at the Mayo Clinic, was brought to the Sanitarium in September and it was my privilege to follow the patient for a time, when he was removed. He had a typical fever-course and is at present in complete remission.

We have worked under many disadvantages, at times when we had a patient whose family consented to the inoculation, we could not get the blood, and at other times we could not get the consent of the family, even though they were informed that the patient had everything to gain as he would certainly die as they all do in usually from one to three years when not treated. We are endeavoring to keep a continuous supply of blood available and by this means hope to inoculate patients hereafter as they are presented.

Dr. Harry Solomon, of Boston City, Psychopathic Hospital, reports that they have treated 125 general paralysis patients with malaria and have obtained 30 per cent remissions. Another 25 per cent of patients treated have shown a more or less satisfactory result, in that they are considerably better but not capable of returning to their work. He further states: "It seems to me that there is no question whatever of the value of this treatment in certain cases and I believe it has a very distinct place in the therapy of paresis until something definitely better is found."

Dr. Paul O'Leary of the Mayo Clinic in a paper read at the session of the A. M. A.,

1928, gave his fourth annual report of the first 57 cases of paresis in which treatment by malaria was given at the Mayo Clinic between May, 1924, and February, 1926. It showed that in 41% complete remission continued and in an additional 24% the improvement previously noted was maintained. The patients "in remission" were retaining their former occupations and supporting their families, and those who were partially improved were unable to maintain their former positions, but worked for short periods at various occupations, usually of a mere menial type and without responsibility. Included in the improved group were several patients who had been confined to a sanatorium or hospital for the insane but are now paroled and because of their financial status are not obliged to work. He further states that the outstanding observations in the fourth year's review of the cases of paresis have been the serologic changes. In the first two years following the treatment by malaria, hardly any change was noted in the serologic study of the spinal fluid or blood; at the end of the fourth year, however, nineteen of the twenty-three patients (82%) with paresis, who are still in remission, have shown a complete negative of the reactions on the blood and spinal fluid. He further states that too much significance should not be attached to this observation and that the fact must be borne in mind that serologic reversals in cases of paresis warrant long observation, and, until the opportunity for extensive microscopic study of the brains of patients treated by malaria permits a comparison of the pathologic and serologic data, conclusive deductions are not warranted.

Conclusions: A larger percentage of uniform and constant results have been obtained by the malarial inoculation than any other treatment of paresis. The danger and death rate are very low when we consider that we are dealing with a condition that means certain death anyway unless there is some interference, and malaria is, so far, the very best we have. These cases must be selected and inoculated as early as is possible, for everyone knows that there is no such thing as a brain-cell regeneration, once the destruction has occurred.

Dementia may be arrested but not cured. Many unfortunates have been thus far restored to their families, as companions and only support. It seems to me that it behooves the medical profession of Kentucky to co-operate with those few who are endeavoring to use the best, safest and only remedy that the profession has and educate the public and some of the profession along this line of treatment. Practically nothing, so far, has been done for these unfortunates in our large state institutions. I believe two inoculations were

made at Central State Hospital during the past year or so, but it is learned that the heads propose instituting the treatment soon.

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DISCUSSION

Wm. E. Gardner: I have listened with a great deal of interest to Dr. Scott's paper and his case reports. I want to congratulate him on being the first to present to this society, so far as I know, a paper relative to the treatment of paresis by malarial inoculation. This subject has been of great importance to those who are having any experience with cases of paresis, and I have been greatly interested in reviewing the literature, from time to time, especially the experiments that have been made by Wagner Von Jauregg in his clinic at Vienna. There has been reported from that clinic a large series of cases of paresis treated by malarial inoculation, in which they seem to have secured a higher percentage of remissions by this method than by any other form of treatment heretofore used.

It has only been within the last four or five years that much work has been done in this country on the malarial inoculation of paresis. Dr. Paul A. O'Leary, of the Mayo Clinic, has perhaps reported the largest series, having treated by malarial inoculation some 358 cases of neurosyphilis, 220 of which were said to have had unmistakable signs of early or advanced paresis. The percentage of remissions reported by O'Leary is quite high; 41 per cent. This is somewhat higher than other workers in this country have been able to obtain. Some important work on this method of treatment of paresis has been done by Dr. C. W. Stone, a neurologist of Cleveland, in conjunction with the department of dermatology and syphilology of the Cleveland City Hospital. These workers have had a high percentage of remissions, but not quite as high as that reported by O'Leary. Dr. Franklin G. Ebaugh, of Denver, has reported a series of cases in which favorable results were secured, and calls attention to the fact that most of his patients given malarial treatment have some mild delirious reactions with little or no maniacal excitement and they are able to be controlled in the semi-convalescent ward of a general hospital.

In the American Journal of Psychiatry, of March, 1928, Max A. Barr and W. L. Bruetsch, the Central State Hospital at Indianapolis, reported 100 cases of paresis treated by malarial inoculation. They stated that only about 25% of the patients showed remissions, that these had been able to leave the hospitals, but were able to work only part of the time. They were

somewhat doubtful about complete remissions in the 25 per cent they had reported, as perhaps some of these had not stood up as well as they had anticipated. Another 25% were markedly improved, and there were 23 deaths.

Most of these percentages are much higher than we have been able to obtain by the standardized older methods of treating paresis, and perhaps the danger to life is not materially increased. There are some serious possibilities, however, in connection with malarial inoculations. In the presence of cardio-renal disease one should proceed rather cautiously. The literature shows that patients have died from abscess of the liver or spleen, acute yellow atrophy of the liver, endocarditis, acute nephritis, etc. Some authors have reported rather severe types of hematuria during malarial treatment. Strange to say, the majority of those who have reported cases treated in this manner have not laid much stress on the deaths they have had. Even O'Leary has made little or no comment on the deaths in his series of cases.

Practically all of the workers who have been using malarial inoculation advise following with mercury, arsphenamine, tryparsamide, bismuth, etc., so after all, the question is whether malaria alone will produce as satisfactory and prolonged results, in a large series of cases, as if this treatment be followed by the old standardized method of treating syphilis, which has been the rule in most of the cases treated by malarial inoculation. Dr. O'Leary is inclined to treat a large series of cases of non-paretic neurosyphilis, that is cases of meningo-vascular or diffuse cerebro-spinal syphilis, by malarial inoculation with the idea that some of these may be arrested before they have advanced to the stage of paresis. Most neurologists and neuro-pathologists have agreed for a number of years that diffuse cerebro-spinal syphilis does not usually progress to the stage of paresis, supporting the dicta "once cerebro-spinal syphilis, always cerebro-spinal syphilis, or once paresis, always paresis." In paresis and tabes dorsalis, therefore, the parenchymatous degeneration of the brain and nerve tissue does not originate from a previous attack of so-called cerebro-spinal syphilis, and the question might arise here whether or not the position is well taken in treating a large number of cases of diffuse cerebro-spinal syphilis in the attempt to prevent the development of paresis, because it is this type of neurosyphilis which responds very readily to the standardized method of treatment by mercury and the arsphenamines. Even the older method of oral administration of mercury and iodides has perhaps arrested many of these cases of diffuse cerebro-spinal syphilis.

Dr. Scott's paper has been most interesting, and he has given us a very practical resume of the literature, as well as reporting a few cases of his own, demonstrating the present status of

malarial inoculations in the treatment of paresis. Such was the title of his paper and he has handled the subject in a way that has been most gratifying. His conclusion that this method seems to offer a higher percentage of remissions than any other form of treatment instituted prior to this time appears well founded.

It is not an easy matter, however, to preserve a strain of virile plasmodium where one has the opportunity of treating only a small number of cases. For example, in the psychopathic ward of the Louisville City Hospital, we may have one or two cases of paresis at the same time, and may not have another case for weeks. It is also difficult in private practice to keep in active incubation a virile strain of malarial organisms.

To pursue this form of treatment most successfully it seems that it should be done in a large hospital for mental diseases, like a state or psychopathic hospital, where there are a sufficient number of cases to keep the strain going. There will be a temptation in handling a small number of cases in private practice to continue the strain through some patients with diffuse cerebro-spinal syphilis in the hope that it may be beneficial to these cases, and at the same time keep alive active malarial organisms which may be used in well defined cases of paresis.

The diagnosis of paresis is of some importance, and it would be interesting to know whether, in the large series of cases with high remissions that have been reported, all were true paresis or whether many of them might not have been diffuse cerebro-spinal syphilis. It is just as important that we have some clinical symptoms of paresis as well as positive serological findings in arriving at a correct diagnosis. From the serological standpoint there should be an increase in the cell count of the spinal fluid, on an average of 30 to 50 cells to the cu. mm., sometimes less, with an increase in globulin, and a strongly positive Wassermann reaction, but most important of all is a positive colloidal gold test, or what is known as a "paretic curve."

There should be at least a few outstanding clinical signs in the form of pupillary and speech disturbances, some tremor of the eyelids, tongue or hands, some irregularities of the tendon reflexes, and usually a positive Romberg sign, even in the absence of any noticeable mental disturbances. If careful inquiry be made it can usually be determined that there has been some loss of memory or a change in conduct of the individual with tendencies toward extravagance or carelessness in the management of his business affairs. In more advanced cases there will usually appear the characteristic delusions of wealth and grandeur, or in others a rapid mental deterioration without delusional trend.

A doubtful colloidal gold test with a cell count ranging from 60 to 100 would have a tendency, in the absence of clinical signs of paresis, toward

the diagnosis of diffuse cerebro-spinal syphilis. The simple facts of a four plus Wassermann with a high cell count, an increase in globulin, and a doubtful paretic curve without any clinical signs would not justify a diagnosis of paresis.

I think there is some danger, therefore, that workers may become over enthusiastic about a treatment of this sort and include in their series a large number of cases which do not represent that form of parenchymatous degeneration of the brain of which we speak when we use the term, paresis.

As mentioned by Dr. Scott, remissions in paresis have occurred from the use of other forms of fever therapy, for instance tuberculin, and now many observers are recommending typhoid vaccine in the treatment of this disease, giving a series of from ten to twenty intravenous injections of 250,000,000,000 to 350,000,000,000 dead typhoid bacilli, every two or three days, which produces a reaction with fever ranging to 103 or 104 F., lasting ten to twelve hours. In the *Journal of the A. M. A.* for October 15th, 1927, Kunde, Hall and Gerty reported a series of 48 cases treated by typhoid combined vaccine in which they secured a percentage of remissions almost equal to that obtained by the malarial treatment. This form of treatment would appear especially valuable for physicians who have only a small number of cases, and in hospitals where malarial blood cannot be obtained. O'Leary has treated a series of 26 cases by typhoid vaccine, giving the very large doses which have already been indicated, in which he had very favorable results, but states that the percentage of remissions was 15 per cent less than in patients treated by malarial inoculation. It is important to bear in mind, therefore, that remissions in paresis may be obtained by fever produced by various forms of foreign protein, even milk injections which have been employed by some, and the only logical reason which we know of for the employment of malaria in the treatment of this disease is that the fever can be controlled promptly by the use of quinine.

The maximum clinical improvement of cases treated by malaria is not usually reached before the end of the first year, and according to O'Leary negative serological changes in the spinal fluid do not occur until the end of the third or fourth year. It is the opinion of most workers that very little, if any anatomical changes in the brain tissue are produced by malarial treatment, although some have held that there is a tendency to the formation of gummas inasmuch as some have been noted in the skin of patients who have had this form of treatment. If this be true, it would have a tendency to offer a more hopeful outlook for permanent improvement, inasmuch as syphilitic gummas usually respond to the use of mercury and the arsphenamines.

This whole question of fever therapy is very

interesting, and our greatest hope lies in the fact that it is a step forward and may lead us to some more rational and less empiric form of treatment for syphilis of the nervous system than by malarial inoculation, alone, which at this time rests upon very popular but insecure scientific hypotheses.

We shall be glad, in our work at the City Hospital, to co-operate with Dr. Scott in an effort to keep going an active strain of malarial organisms, if possible, in order that he may have an opportunity to enlarge his series cases.

H. B. Scott, (in closing): I regret very much that Dr. Curran Pope could not be here because of illness. He is very much interested in the subject of malarial inoculation in the treatment of paresis, and I believe he could have thrown some light on it. I am sorry the members have not said more about it or at least asked some questions which I would have been glad to answer if I could. One question that seems to be going the rounds is: is it the high fever that does the work? That is a question that no one seems to be able to answer. In one of the cases that I reported, the one who has complete remission at present, the patient had chills and subnormal temperature nearly all the time. So it is evident in that case fever did not produce the result. Whether the fever does or does not influence the result we do not know. Most authors seem to think that high fever has nothing to do with it.

For quite a number of years I have been trying to treat paresis by the older standardized methods and had nothing but failures. I had two cases several years ago, both patients typical paretics, and started them on the old-time treatment at the same time. Both improved wonderfully, the symptoms disappeared, and they were both reasonable and rational. Just about the time I thought a successful method of management had been discovered, they had a relapse and both were sent to Lakeland, where they afterward died. I have never obtained any worth while results in paresis with the old-time treatment. Malarial inoculation is the only method that seems to offer benefit to the patient, and it seems to me we should follow this closely and use it until we get something better.

Some one spoke of the prevalence of malaria and the rarity of paresis in the South and suggested that a former attack of malaria might have some influence in preventing paresis. I formerly entertained similar ideas, but other writers seem to think a previous attack of malaria has nothing to do with it. This has been proven by the fact that at one time quite a number of German army officers developed paresis even though many of them had suffered attacks of malaria previously according to the history. Therefore it would seem that an attack of malaria has nothing to do with preventing paresis, since paresis has developed in many cases following malaria.

The inoculation treatment is purely empiric. We know little about it except that in 25 to 30% of the cases we are able to secure fairly good results. How many of us know anything about electricity, what it is and whence it comes? We know what it does and how to control it, we use it and get good results from it. So why not use malarial inoculation so long as we are securing good results. We do not care what it does so long as the patient is benefited. There are many other things in medicine that we cannot explain, especially the action of various drugs, yet we use them with more or less success.

SECONDARY ANEMIA TREATED BY INTRAPERITONEAL BLOOD TRANSFUSION*

By LEE PALMER, M. D., Louisville.

On August 25th, 1928, I was called to see M. O. C., a white female, aged 1 year, suffering from diarrhea and extreme weakness.

Family History: There are four other children, who have always been well and strong. Other family history is not remarkable.

Past History: The patient was one of twins. Full term, normal labor. Birth weight 4 pounds, while the twin weighed 5 pounds. Both babies were nursed and given Eagle Brand milk according to directions on the can as a complementary feeding. The larger baby gained weight and developed normally. The smaller, however, was very weak, nursed poorly, cried a great deal and because she did not gain was taken off the breast and given a dilute cow's milk mixture. On this formula, the baby gained very little and had frequent mild gastrointestinal disturbances. Had always been very pale and, as the mother expressed it, "seemed to have no blood." Since birth she had always been extremely weak, was able to turn herself very little and could not sit alone.

At three months of age she was started on orange juice. Had never been given C. L. O., beef juice, cereals nor vegetables.

She had measles followed by bronchopneumonia at six months from which recovery was very slow.

Present Illness: August 23, two days previous to my first visit, she started with a diarrhea, watery, green foul-smelling stools, which contained mucus and milk curds, having 5 to 6 stools daily, with each stool she screamed as if in intense pain. Had had some fever and was very drowsy. Since the diarrhea started she had been growing rapidly weaker, lying in a stupor most of the time with eyes held fixed.

*Read before the Jefferson County Medical Society, January 21st, 1929.

Physicial Examination: A white girl baby about 1 year of age, weighing 11 pounds, who appeared extremely malnourished, very pale, and acutely sick. The head showed prominent frontal and parietal bosses. The anterior fontanel was very large, about $3 \times 3\frac{1}{2}$ fingers. Conjunctivae were extremely pale, pupils reacted to light and accommodation. Eyes were turned upward and held fixed. Mucous membrane of mouth and throat very pale. Lymph glands were not enlarged. Thorax showed a rather marked rachitic rosary. The heart was not enlarged; a faint systolic murmur was heard over apex but was not transmitted. Abdomen somewhat distended. Liver 1 finger below costal margin. Spleen not palpable. Skin pale and dry. Muscles very flabby. Urinalysis negative.

Blood Examination: Hemoglobin 20%, erythrocytes 1,750,000, leucocytes 6,900. Smear, polymorphonuclears 45%, lymphocytes 53%, transitionals 2%.

The red cells showed moderate anisocytosis, slight polychromatophilia and marked achromia, central areas of cells showing marked pallor and only periphery of cells showing staining properties.

Diagnosis: 1. Diarrhea. 2. Malnutrition.

Severe secondary anemia. Rickets.

The diarrhea and general condition of the patient treated for three days. In the meantime the patient's blood was matched with both parents and found incompatible.

August 28th, the patient was admitted to the hospital for blood transfusion. On admission the baby showed considerable improvement in general condition. The temperature was normal, diarrhea had improved and she was somewhat stronger. Blood count: Hemoglobin 20%, erythrocytes 1,600,000, leucocytes 6,000, polymorphonuclears 55%, lymphocytes 45%. Weight on admission was 11 pounds 6 ounces.

Due to the fact that we had no suitable donor an intraperitoneal blood transfusion was done, giving 100 c. c. of the father's citrated blood. The patient was in good condition following the transfusion. Twelve hours later, however, the temperature was 104° F. and there was moderate abdominal distension. Thirty hours after the transfusion the temperature was 106° F., marked abdominal distension, stiff neck, positive Brudzinski, positive Kernig sign. Examination of the eye grounds, however, was negative. Believing the meningeal signs due to the reaction no spinal puncture was made. The patient was treated symptomatically and within two days—August 31,—the temperature was normal, abdomen soft, stools normal and all meningeal signs had disappeared. A blood examination on this day showed hemo-

globin 30%, erythrocytes 1,820,000.

The baby was fed a protein milk preparation, beginning with about one-fourth her caloric requirement and increasing as rapidly as was safe. Beef juice was added to the diet. The weight increased at the rate of 2 to 3 ounces daily.

September 2nd, hemoglobin 45%, erythrocytes 3,150,000. A second blood transfusion was given on September 5th, 100 c. c. of father's blood intraperitoneally by citrate method. There was no reaction whatever following this transfusion. A blood examination four days later, September 9th, showed hemoglobin 60%, erythrocytes 4,220,000.

A diet was outlined for the baby containing 1 quart cultured milk, 1 egg yolk, beef juice, liver juice, cereals and green vegetables. Cod liver oil and sun baths were also prescribed. September 10th, patient was dismissed from the hospital showing a marked improvement and weighing 13 pounds.

Follow-Up Notes: The baby was seen in the office September 17th. She had a good appetite, eating and digesting all food allowed. Her weight was $13\frac{1}{4}$ pounds. There was moderate tanning of the skin from sun baths. She was able to sit alone and played a great deal.

October 2nd, weight 14 pounds, 5 ounces. Gaining in strength and much brighter.

October 10th, the last time the patient was seen, as family moved out of the city. She was still improving, gaining in weight and strength. Weighed 15 pounds and was able to pull herself up to chairs. The appetite and digestion were still good, her color improving. Hemoglobin estimation at this time was 70%, erythrocyte count not made.

DISCUSSION

L. Wallace Frank: I do not know much about pediatrics, but for several years have been very much interested in blood transfusion. It was demonstrated definitely some years ago, by the injection of pigeon's blood into the peritoneal cavity of experimental animals, that the blood was taken into the circulation unchanged. Three years ago Meyers reported twenty-five cases of intraperitoneal injections of blood in marasmic children, with good results and no reactions. It seems with the intraperitoneal method one can absolutely ignore the question of matching the blood. It is taken directly into the circulation, consequently the serum is absorbed, the cells carry on the work and there will be no reaction. There are a few points of disadvantage, however, and the procedure is not without danger.

I think the reaction in Dr. Palmer's case was due largely to the fact that the child had an infective diarrhea and was in serious condition. There has been one case reported where the introduction of blood into the peritoneal cavity was followed by death. That, of course, must

be considered and the use of this method in cases where abscess or infection is present is attended with danger. In such cases it is advisable to practice direct transfusion and with the facilities we have now there is no reason why we cannot do this successfully.

After intraperitoneal injection of blood subsequent celiotomy has been performed we have found no adhesions and no accumulation of blood. Four years ago we had a case of purpura hemorrhagica and gave the patient four intraperitoneal injections of blood. At operation 12 days later, no blood was found in the abdominal cavity and there were no adhesions. This procedure has greater uses than we have heretofore thought. The use of blood in the treatment not only of anemia but in other cases is going to become more common. In children the intraperitoneal injection of blood has a great many advantages over its introduction into the circulation or into the longitudinal sinus. Oftentimes we have difficulty in introducing blood into the longitudinal sinus, and the intraperitoneal method should certainly not be forgotten.

Wm. E. Applehaus: I have listened with a great deal of interest to Dr. Palmer's report of this interesting case. The thought just occurred to me that the gastro-intestinal tract may have been the underlying cause in this child's anemia. The fact that this child has had digestive disturbances since birth and was unable to properly assimilate its food made it a ready victim for any type of infection. Diarrheas in children are usually due either to improper feeding or infection. I believe this child had a low grade infection in the colon since birth or for a long period of time which became more active as the disease progressed. One constant feature of ordinary infections of the colon is their chronicity.

I would like to ask Dr. Palmer if he thinks that this child would have made as prompt a recovery if the blood had been given intravenously, or if he thinks that the reaction probably due to the injection of a foreign protein was the cause for the improvement. A very interesting feature of this case was that the patient had rather violent reaction following the first intraperitoneal injection but none after the second.

I have seen several patients with rather severe infections in the colon, when other types of treatment had apparently failed, respond very favorably to intramuscular injections of some type of foreign protein.

A. R. Bizot: The case report and discussion remind me of hemorrhagica neonatorum. I have never seen one of these cases that did not die after intraperitoneal injections of blood as mentioned by Dr. Palmer. Before another medical society not long ago Dr. Bruce reported a case of hemorrhagica neonatorum, and for some reason they could not inject blood into the fontanel and made the injection into the abdominal cavity. Ten days afterward it became nec-

essary to do some surgery on the child. Dr. Abell opened the abdomen and there was the blood in the peritoneal cavity from the injection. Shortly after that, and two weeks after Dr. Bruce reported his case, I saw a child in about the same condition and injected 30 c. c. of blood into the peritoneal cavity. The child was still bleeding from the mouth, nose, rectum, etc. the next day and I injected another 30 c. c. of blood into the peritoneal cavity. Four days later the child died. Permission for partial necropsy was obtained. I opened the abdomen and there was the blood in the peritoneal cavity. So it would seem that the injected blood is not absorbed in all cases.

Lee Palmer, (in closing): If there is an infection of the peritoneum or infection in the blood stream, I think it would be foolish to inject blood into the peritoneal cavity. It would probably not be absorbed, but act as culture media for organisms to feed upon.

I would like to call attention to the fact that this child had been having diarrhea for only three days; there were five or six stools daily; the stools were foul-smelling and contained mucus but no blood as we would expect to find in an ulcerative diarrhea. If there had been any peritonitis, I cannot understand how within two days after the injection of blood the abdomen was soft and the patient decidedly improved.

It is impossible to say how much of the improvement was due to the injection of foreign protein. The child began improving immediately after the transfusion. Two days later there was an increase in hemoglobin of 7 per cent and an increase in red cells of 200,000. Whether or not the patient would have been benefited equally by intravenous transfusion we cannot tell. I have seen several cases, perhaps less severe than this one, and they were all benefited by intravenous transfusion.

With reference to the blood not being absorbed: Siferstein has written several papers, one in 1925, in which he gives a splendid review of the work done on intraperitoneal blood transfusions. Considerable work was done on intraperitoneal transfusion as much as sixty years ago. In 1885 Ledderhose demonstrated that blood injected into the peritoneal cavity of a large number of dogs caused an increase in the hemoglobin and red cell count after a few hours. Many authors have experiments to show that absorption takes place following intraperitoneal blood transfusions. In 1884, Hayem conceived the idea of taking rabbit blood and injecting it into the peritoneal cavity of a dog, then trying to find with the microscope rabbit cells in the dog's blood stream. He was able to do that because there is a marked difference in the size of the red blood cells of the rabbit and dog. He found when he injected rabbit cells into the dog that the cells were destroyed. In other words,

there was something that caused hemolysis of the rabbit cells in the dog, but he was able to demonstrate free hemoglobin in the dog's serum. Then he injected dog cells into the rabbit's peritoneal cavity and was able to find red cells of the dog in the general circulation of the rabbit.

I have seen quite a number of children who were given intraperitoneal injections of blood, and in all the cell count almost immediately improved.

MY IDEAS ABOUT BABY FEEDING*

By ALEXANDER NETTELROTH, M. D., Louisville.

I have long been out of agreement with the dietetic regulations current in the treatment of invalids, the regimens advised for normal people, and especially with the array of formulae (all based on milk) devised for the nourishment of babies. The degree of my disapprobation can best be expressed by the statement that I consider them all to be 90 per cent nonsense.

I do not refer to the carefully worked out regulations developed for diabetics nor to a few other well founded dietetic prohibitions; nor, of course, to the newer appreciation of the necessity of well balanced diets especially in relation to the accessory food factors.

My great disagreement is in relation to what may be considered acceptable as food for infants; nourishment capable of promoting normal growth and of being reasonably assimilable. I do not say digestible for I hardly comprehend the term when I hear it used to make a categorical statement that such a food is easily digested, another difficult to digest, or indigestible, implying that what is slow to undergo the disintegration of the digestive process is necessarily injurious, while that which is rapidly chymified is obviously more wholesome. There is a difference, of course, that may have a bearing on the functional integrity of the digestive tract, but unless the slowly digestible or even indigestible food substances bulk so largely as to impede the progress of the general mass of nourishment through the intestine, I can not imagine them harmful if they are not of a nature to give off toxic fractions when acted on by the flora of the alimentary tract.

Indeed a certain amount of undigested residue is thought to be desirable to promote the peristalsis of the lower sections of intestine and thereby obviate the constipation that is so mortally feared by my confreres, but which, while I do not consider it a wholly negligible factor in the well being of the race, I do not regard with such apprehension as often to resort to purgatives for its correction.

If this is true of adults why not of babies?

None of us has failed to note the constipation following the more completely utilized diets; the alimentary tract wants roughage, so why wait until an advanced age to supply it? Could it not be begun tentatively in early infancy?

I may in this connection speak of "Nahr-schaden," so much mentioned in German literature. This is the hypothetical damage caused by foods of varying digestibility; that also is difficult for my comprehension. I cannot conceive of the digestive organs battering themselves to pieces attempting to master a recalcitrant food stuff, or struggling on in an unequal battle until they fail from exhaustion. I can comprehend that food substances that are not readily resolved into a soft pabulum may sometimes cause a mechanical injury; that excessive bulk may cause an obstructive impediment, and that toxic deterioration (principally from bacterial activity) may cause much trouble; but when these factors are eliminated I do not see that there can be any wrench or strain of the mechanism of digestion.

"Nahr-schaden" I visualize as those abnormal states produced in the assimilative organs and in the body tissues by foods lacking the corrective factors of the complementary vitamins, and I believe that the gross or the molecular structure of the foods has little to do with its causation. If these premises be true the whole question resolves itself into the problem as to what, of that which is assimilable, is best suited to promote physiological growth and harmonious development.

The answer to that question carries with it the whole art of infant feeding; and it is the art as now practiced that I differ with almost the whole body of pediatric authorities.

Twenty years ago I had the temerity to criticize the food formulas recommended by a celebrated New England "authority" who published a book for the use of young mothers. Therein he gave much sound advice about the care of infants, but his fear of damage to the young alimentary tract was evidently such an obsession that he had a horror of any food that might contain particles that were not at least as soft as butter or as palpable as dust. I believe that this book is now largely discredited as containing, not a comprehensive scheme for nourishing babies, but as being a complete guide for undernourishment.

I do not subscribe to the canonical doctrine that nature has evolved a perfect system of infant feeding which must be followed as closely as may be unless one wishes to court disaster. Under nature's specifications there has been provided for the young of mammals, in their unsophisticated primitive domain, a scheme of mammary nutriment just sufficient to tide them over the short helpless period

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when the alternating crises of food plethora and food famine, (the common lot of animals and primitive man) would be disastrous to the feeble offspring. But to concede so much is not to imply that art may not improve on the primitive specifications of nature. Or if I am too bold in casting aspersions on nature's methods by denying that nature is "so grand" (to use a colloquialism) I can yet fall back on the assertion (not easily controverted) that we as humans, even to a greater extent than our pampered and certified cows, are not living in a state of nature, and that mammary alimentation so produced does not measure up to the specifications of nature's commisar.

I will make the bold statement that the best milk produced by the human or animal mammary gland is not a complete food, and that it was primitively unnecessary that it should be so. The short period of animal infancy made its deficiency unimportant; nor had it attained a great importance in the savage infant; these happy youngsters swallowed anything they could get hold of that seemed to their instinctive faculties designed as food for their species. That they also swallowed a variety of articles that were not so designed goes without saying; but the progress of intellectual evolution has not greatly curtailed that habit in our own offspring.

Having now paid my compliments to the inadequacy of milk as a food for babies, I will go into the details of my objections. I agree that the milk of a normal well nourished mother may carry with it the gross elements of nutrition as represented by protein, carbohydrate, and fat; but I am sure that no mother's milk nor any modification of cow's milk (unsupplemented) carries with it an adequate supply of the subtle food factors now designated as vitamins; and therein, in my opinion, lies largely the solution of the problem of infant feeding. As far as the gross elements of nutrition are concerned, there exist surely very wide factors of safety, but in many infants, apparently normal, the factors of safety in relation to vitamins are very narrow indeed. So we see the surprising instance of babies seeming to thrive well on such an unbalanced diet as condensed milk administered for long periods, while others will early show the grossest evidence of malnutrition on breast milk or on the most painstakingly devised substitutes.

This brings me to my own solution of the difficulties; I had observed first with wonder, then with complacency, and lately, I hope, with understanding, that among my patients of foreign or rural extraction babies were very early fed from the table at which they were placed for reasons of domestic conveniences; and I have never observed this

method to be followed by any of the disasters that one might have been led to expect from such assaults on the citadel of the infant's digestive forces. They thrived amazingly, and when the factors of food infection were eliminated, far better than the carefully directed infants of some of the unfortunate rich.

This has led me to see what supplementing breast or bottle milk would do in my practice, and I have come to the conclusion that whatever will adequately nourish adults will also properly nourish infants, and that their digestive capabilities are not only excellent but that they are amazing. That food is to be presented to them liquefied or very finely comminuted seems to be a matter of common sense, though I would not like to shock any one here by defining the size of a piece of meat, for instance, which a very young infant might, if need be, dispose of quickly by its digestive mechanism.

As I have intimated, I believe that there are proteins, carbohydrates and fats available for infant feeding superior to those found in any milk, and that in the matter of vitamin content, milk is quite out of the race.

Now you may properly ask what I am doing about it and that is briefly told.

I am not going to bother to find out what food preparations could advantageously replace milk, because that would be too much trouble for me and in the end a colossal amount of trouble for the mother. Milk is, grossly, adequate and very convenient; its deficiencies are overcome by reducing the period of nursing, not according to age, but guided by the physical growth and by the appetite of the individual infant. What milk lacks I supply, not at three or four months, when the inherited store of vitamins is sadly depleted, but from the day of birth. Just today I noted that a 4-day old infant at the infirmatory which had lost four ounces (and the preliminary water loss is inevitable) has already gotten back to its birth weight; it is getting a tablespoonful of whatever vegetable juices the hospital affords alternating at times with two teaspoonfuls of orange juice in three or four bottles of the water given daily between nursings.

My general instruction to mothers is to nurse the infants at the breast as long as the supply seems adequate, but from the beginning to give vegetable juices in the quantities just mentioned, in the water taken between milk feedings.

My preference, though any vegetable will do, is for the juices from cabbage or sauerkraut, spinach or tomatoes, and the juice of oranges; the frequent administration of broth meets with my approval.

At three months at least, I recommend three meals a day; these are to be composed of

scraped or finely chopped meat, meat broth, cereals, and any mashed vegetable available, to be mixed or divided among the meals as convenience or the acceptance of the infant may dictate.

I would desire every mother to nurse her infant at the breast for two or three weeks because I think the proper involution of the uterus is promoted thereby, and that perhaps some immune principles are conveyed to the child by the colostrum and the early milk secretion. After that period breast nursing is continued if it goes well, if not, I am indifferent. I can do better with boiled cow's milk or milk powder when supplemented as before indicated.

To recapitulate, I do not believe that the food for an infant has to approximate the molecular structure of mother's milk, nor that the protein content must be as meager,—protein of all kinds is well borne by normal infants, and protein milk has been used to advantage. What a baby does not digest will not harm it if it contains no inherent toxicity; what it assimilates into the tissues may cause much constitutional harm, and therein lies the morbid factor of much mal-nourishment. Vitamines seem to be the activators and correctors of assimilation. What has passed through the alimentary tract has done no harm if it has not scraped off any mucous membrane, but what has remained in too long, or especially what has been taken up without its vitamine complement to insure its proper elaboration in the tissues may be deadly indeed.

I have had no experience with this method in premature infants but I had last spring in one week two babies that weighed a little over five pounds at birth; the one at the hospital gained six ounces the first week, and the other at home in the country gained eleven ounces. I weighed it at birth and at the end of the first week the mother who had weighed it herself at the bedside, reported the gain to me. I told her that it was not possible, that she evidently did not know how to substract ounces, at which she said I was not very complimentary. I weighed the baby myself and found she was right. She had given it, between nursings, juices of the numerous vegetables her market garden afforded, with frequent additions of soup or broth. The child is now an exemplar of the neighborhood.

You may not agree with what I have written, but you must agree that I am not a worshipper of medical traditions.

In conclusion I wish to emphasize that I think that the milk obsession has been the greatest factor in retarding the development of a liberal and proper diet for babies. The mammary secretion was, as I have mentioned in another article, a pragmatistical arrangement

of nature, she could do no better, but she did not intend it to be relied on, unsupplemented, for a protracted period. I have noted that the protein content of human milk is decidedly less than that of most mammals. Certainly this is not to the advantage of the baby, but it is evidence, perhaps, of a letting down or falling off from the physiological standard that nature endeavors to maintain in spite of domestication and civilization.

I think that the crying of so-called colicky babies is more often caused by hunger or mal-nourishment, and that the trials and tribulations so frequently encountered in trying to adjust a varying succession of milk formulas to some recalcitrant infants will vanish through early and adequate recourse to the amazingly effective vitamine bearing foods found in the vegetable kingdom.

And babies can digest meat splendidly; scrape it, or grind it in a machine, or disintegrate it in broth or soup, but do not be afraid to give it at any age.

To the laboratory toilers who are laboring to produce a mothers milk substitute that shall have not only the protein, fat, and carbohydrate percentages of human milk, but also a closely imitated molecular structure, my compliments—they are wasting their time.

My slogan is that, there are better foods than milk but none so convenient, and I quote my friend Dr. Gage, of Denver, who has said in effect that "Milk is useful, convenient and sometimes deadly." Because of that undeniable convenience I shall continue the customary use of milk in infant feeding but I shall fill in the gaps and deficiencies of this monotonous diet by immediate resort to fruits and green vegetables and by early additions of cereals and meats, with the firm conviction that a mental and physical advancement of as much as 25 per cent can readily be gained within the period of infancy by such a procedure.

DISCUSSION

J. H. Pritchett: The essayist's paper is certainly out of the ordinary and I am glad to have heard it, because the most of us are too prone to follow obsolete text-book teachings in regard to infant feeding. It is one of the best papers I have ever heard read before the Jefferson County Medical Society, and I think we can all profit by it.

While Dr. Nettelroth was absent last summer I had the opportunity of seeing several of his young patients who had been fed vegetable and fruit juices as he has told us, and must confess that they were wonderful specimens of babyhood. I must also confess that thus far I have not had the nerve to begin feeding fruit juices as early as the essayist suggests. Since hearing his splendid paper I shall be glad in the future to try this method.

I recall that during my last few days in London after the armistice had been signed, I was in the wards of the Great Ormond Street Children's Hospital, and Dr. Still who at that time was one of the world's leading pediatricists, stated that some infants seemed to thrive better on vegetable and fruit juices than on milk alone. Undoubtedly there is much in Dr. Nettelroth's paper that we can accept and use. We see many athreptic, marasmic and under-nourished infants, and in these I believe the feeding of fruit juices as advocated by the essayist will be a great value.

Much of the information contained in text books on the question of infant feeding is pure "bunk."

Many of you will remember that years ago we had in our college curriculum instructions concerning the use of the Bayner formula in the feeding of infants. It has never reached the point of simplicity, yet in certain cases it is valuable. I believe we are all in accord that the best food for an infant is mother's milk. I also agree with the essayist that where infants are not thriving on milk, instead of trying artificial food mixtures, we will get better results by tiding them over by feeding them various vegetable and fruit juices.

We must constantly bear in mind the infant's weight, age and tolerance to fats, proteins and carbohydrates. The average infant will do well on a scheme of $1\frac{1}{2}$ ounces to 2 ounces of milk per pound weight and 2 ounces more at each feeding (up to 6 months) than he is months old. At intervals of three to four hours a good raw milk, certified preferred, which should be boiled 1 to 3 minutes always, this destroys practically all bacteria, and at the same time does not affect the vitamins.

J. S. Lutz: I have enjoyed Dr. Nettelroth's paper which teaches us some of the things we need to know about infant feeding that is practical. Some babies can be fed on almost anything and they will thrive, while others will not. I think the idea of feeding vitamine containing foods is excellent, giving first the juice of spinach and orange. Our text books of today, or as stated by the essayist, the writings of so-called "authorities," are not only misleading, but as Dr. Pritchett says "bunk." In text books page after page has been copied almost verbatim from older works the same language being used over and over again.

Success in the feeding or rearing of babies depends on a study of each one of them individually. We cannot feed all infants spinach juice, nor can all of them be fed tomato juice, as they will not take these substances. Some of them will not even take orange juice because it disagrees with them, but by individual study and watching the effect produced, we can always find some vegetable or fruit juice which can be successfully used.

Mother's milk is undoubtedly the best infant

food, but mother's milk varies widely, and I think we are to blame for it because we do not instruct mothers what to eat. If they are told what to eat their milk will be of proper quality. If mothers are allowed to eat chocolate candy, French pastries, etc., their milk will be deficient. Tell the mother to eat plenty of fruit, cabbage, sauerkraut, tomatoes, etc., and she will furnish milk rich in vitamins which the infant very much needs.

Virgil E. Simpson: I think there is much common sense in what the essayist has said and, sometimes, it requires just the sort of treatment he has given his subject to drive home things many are too timid to undertake. Of course, he will get into trouble, he has many times; all of his babies are not prize winners and his mortality rate compares favorably with that of the rest of us. But he has good, hard common sense as an attribute, after all, most essential for success in the practice of medicine and he has, too, an inherent independence of thought which keeps him from being ever a rubber stamp. A tendency to do one's own thinking, when refined by experience, makes for progress. Doing a thing because a Holt or an Abt has uttered it may be safe practice for the tyro but their ipse dixit should be no hindrance to other inquiring, mature minds. And the men who style themselves pediatricists have certainly created a considerable smoke screen about their field of activity. There are but two qualifications a real pediatricist possesses not in the equipment of every practitioner, first an infinite patience and second a knowledge of foods. The latter accomplishment should be a part of the equipment of every doctor. It requires no more brains to know foods and food values than it does to know pathology. A doctor should be as proficient in ordering a diet as he is in therapeutics; he should be as competent to order a diet including its preparation as he is to order a prescription and the one is as easy or as difficult as the other. Both require study, neither is a province of the elect. The open market, usually, affords the desiderata without resorting to canned substitutes. The garden and the meat or poultry house in the country and the grocery and the butcher shop in the city have preserved me from panopeptone or Valentine's meat juices in dealing with an adult diet even as the mother's breast or the dairy have rescued me from Borden or Eagle or Klim with the infant. And now, on the insistence of the essayist, the garden and the poultry yard and the cornfield have come to be an essential part of the nursery. A good cook and a basket of vegetables are more desirable than a tin of Campbell and a clean milkman a better Samaritan than Horlick.

I do not share the essayist's contempt for milk as a food. He referred to skin lesions sometimes observed in nursing infants and their disappearance when weaned and put on other foods. This cannot be denied, but on the other hand one

sees identical conditions develop in children free while nursing. It is not milk alone that may cause trouble, any food containing protein may cause not only skin lesions, but other evidences of protein sensitization such as Asthma or mucous colitis. One might summarize the subject matter by saying that brains is a better equipment for a pediatrician than a logarithmic table.

S. C. Frankel: I have enjoyed the paper very much. I do not entirely agree with the essayist in some of his contentions. In the first place, I think that most of us will agree that he is a little too radical. In the main, however, I think the paper is very practical although the essayist arrives at his results a little differently from some of us.

I disagree with him when he says boiled milk is just as good as certified milk. In other words, he kills the bacteria by boiling the milk and feeds the killed bacteria to the infant. I believe it is much better to use certified milk as it contains only a few live bacteria and does not contain any dead ones.

I disagree with him, also, in regard to the early feeding of various vegetable juices and especially chopped meats. I do not believe that a baby six or eight weeks old, or even a normal healthy infant at ten or twelve weeks, requires anything except milk, mother's milk if possible, if not some modification of certified milk. After two weeks the child may be given some of the fruit juices, such as orange juice, or canned tomato juice. Orange and tomato juice and cod liver oil contain all the vitamins necessary for the growth and well being of the young infant. The various meat broths may also be given to advantage after the third or fourth month.

I believe in the routine feeding of infants—by the clock and not by the cry. I disapprove of giving babies vegetable juices, broths, etc. between regular feeding times. Broths, fruit juice or the watery portion of boiled vegetables should be given at feeding time, and there should be definite, regular times for feeding.

If I understand the essayist correctly, he said he fed babies ground or scraped meat very early, —under three months. I believe that is a little too early; the baby gets sufficient protein in milk, and a normal healthy child less than three months old does not require any nourishment like meat. Broth after three months, vegetable juices and especially spinach and carrots, at five or six months, is I think the proper method of feeding.

Alexander Nettelroth, (in closing): I desire to thank the members for their friendly acceptance of my paper and for their generous discussion. When referring to vegetable and fruit juices I did not mean to imply that the baby was given coarse nourishment (other than juices) between feedings. The fruit juices doubtless contain considerable nourishment in the way of protein and sugar, and I can see no objection

whatever to giving them to a young infant. From the beginning I give the infant fruit juices containing vitamins in their drinking water. They would get about the same amount of water anyhow but without vitamins unless fruit or vegetable juices are added.

I do not mean to say that every child will take either orange juice, sauerkraut juice or other vegetable juice. Some of them will not take one or another. Therefore, I called attention to the great variety that may be used in providing the baby with a well-balanced diet, and at the same time be acceptable to the child.

Of course there are food idiosyncrasies as manifested by anaphylactic phenomena, but anyone who observes babies closely enough can readily discover the offending food and withdraw it. There is quite a variety of foods suitable for a young child, and those that cause trouble can be omitted and others substituted.

I do not agree that mother's milk is the best infant food. You can feed the mother but you cannot remove her irritations and nervous upsets that are inevitable in any modern civilized community. I have no objection to feeding mother's milk so long as she is normal and the milk is of proper quality, and so long as the baby thrives on it. If the mother is nervous and irritable the milk will be of poor quality and the baby will not thrive. I give them milk supplemented with the substances I have mentioned.

I also believe there are better proteins than milk protein. It is useless to instruct the mother to give her infant a diet composed of the proper amounts of protein, carbohydrates and fats according to some formula other than those in milk as the main diet is too much trouble, and besides it is almost impossible to make ignorant mothers understand these things.

No trouble can come from giving boiled milk if supplemented with vegetable or fruit juices. I would not think of giving boiled milk if I could not supplement it with the substances mentioned. I have no hesitancy in feeding very young babies boiled milk supplemented as I have stated.

Certified milk is all right, but certifying it does not prevent occasional very dangerous contamination. We can make milk practically safe by boiling, therefore why not use it. In the winter time certified milk does very well, but in the summer time I do not believe it is the proper thing to give a young baby.

State of Thyroid in Skin Diseases.—Out of 65 cases of vitiligo, alopecia, psoriasis, seborrheal acne and other skin diseases, Sparacio found hyperthyroidism in 21 and hypothyroidism in 22. Many patients improve under thyroid medication. In several cases with deficient ovarian function, the basal metabolism was normal. Among the glands of internal secretion the thyroid is the easiest to test by the basal metabolic rate.

THE UMBILICAL CORD*

By EDWARD SPEIDEL, M. D., Louisville.

In this day of surgical obstetrics it may seem somewhat presumptuous to try to interest a society of obstetricians in so trite a subject as the Umbilical Cord. It may be possible however to refresh your memory on some points that you have forgotten and to even bring out something new to you.

It should be remembered that the cord is formed from the abdominal pedicle of the embryo, that the Amnion at first surrounds the cord and later on is attached to it and forms its outer covering. The Amnion covering the cord passes into the skin at the insertion of the cord into the abdomen. Blood vessels from the arteries of the abdomen make a circle around the navel and send up tiny branches 1-8 inch up on the cord. The rest of the cord not in connection with this circulation has no blood supply and must inevitably necrose after ligation. The cord contains one vein and two arteries, surrounded by Wharton's Jelly. These vessels are longer than the cord itself and in consequence become coiled about each other as spiral twists are formed in the cord by movements of the fetus. Considering the attachment of the cord to the placenta we speak of insertio centralis, marginalis and velamentosa. Eccentric insertion of the cord is not unusual, but I have only seen one insertion of the cord into the membranes in my long experience. There is some danger in the velamentous insertion as a blood vessel may be torn when the bag of water ruptures and the fetus die of hemorrhage.

The cord normally should be about 50 C. M. in length. It is found that a length of 32 C. M. is essential for a safe delivery in head presentations and that one of 28 C. M. or less will lead to a Dystocia. The short cord will inevitably cause delay in labor and the tension on the placental surface due to the tugging with each pain may cause a premature separation of the placenta. Even in more favorable cases it has been found that the blood loss during the labor is increased 50%. The most reliable symptom of delayed labor by a short cord is the lack of advance and the quick recession of the head after a pain. As many as nine coils of the cord about the neck are reported in the literature. One of our members it will be remembered reported a case with five coils around the neck. The unusually long cord is a menace during gestation and labor. Intra uterine amputation or constriction of arms and legs in consequence of the cord encircling an extremity and cutting of its blood supply more or less is not

uncommon. Two such cases occurred in the experience of the writer. In one case a macerated baby with a long cord the left arm ended in a rounded stump. In another case, the cord encircled the arm one inch below the elbow the forearm and hand being very white with blue finger nails. The baby died on the tenth day no doubt from toxic absorption from this lifeless appendage as the parents had refused amputation. Coiling of the cord around the baby's neck is so common, that it is practically routine with every obstetrician to insert the finger up to the neck after the head is born in order to loosen the cord should it be encircling the neck. In some instances, it is even necessary to ligate and cut the cord and then follow this with a quick delivery in order to terminate the labor. More than two coils of the cord around the neck will prevent flexion in the mechanism of a head presentation and a face may result.

It is well in forceps applications to insert the full hand into the vagina not only to make an accurate diagnosis of position but to palpate the neck of the fetus to prevent forceps pressure upon coils of the cord around the neck and a probable asphyxia. Auscultation of the fetal heart should be practiced during forceps operations as an irregularity may be due to pressure upon the cord around the neck.

The vein of the cord especially, but the arteries also form loops and the Jelly of Wharton is thicker at such places causing nodes on the cord which are called false knots. A superstition prevailed formerly that these knots in the cord foretold the number of babies that the woman would have. That may have worked in the days when families of 10 and 12 children were common, but hardly in this day of the one or two child family. True knots are formed by the fetus passing through a loop of the cord in the early months of pregnancy. Unusual movements of the fetus may produce so much tension upon the knot as to interfere with the circulation in the cord and cause the death of the fetus. Two such instances occurred in my experience. In one case with a premature macerated fetus death was undoubtedly due to such an interference with the circulation in the cord. In the other case a living child was born largely due no doubt to the fact that the cord was unusually long and the knot was not drawn tight in consequence.

As soon as the baby is born the question of ligation of the cord comes up. The pulsation in the Umbilical arteries ceases very shortly after birth due partly to the exposure to a lowered temperature and mostly to the establishment of the pulmonary circulation as soon as the baby cries and breathes. It should be remembered however that the warmth of the

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baby's crib can re-establish the circulation and unless the cord has been securely tied a severe hemorrhage may follow. It is estimated, that from 25 to 125 c. c. of blood enters the fetal body if the cord is not ligated until pulsation ceases, consequently unless the baby needs immediate attention it is wise to give it this addition to its circulation especially if it is feeble. In ancient days, the cord was not ligated until after the placenta was delivered, practically giving all babies the additional amount of blood. It might be well in consequence to impress upon nurses that there is no danger to the baby in a precipitate birth in the absence of the doctor to delay ligating the cord. It was customary a few years ago to ligate the cord at least two inches from the abdomen and dress the stump toward the baby's left side as the popular supposition was, that if the cord were dressed to the right the baby would be liver grown. The early editions of Williams' Obstetrics actually stated that if the cord is dressed to the right side, the pressure of the binder upon it will cause adhesions of the liver to the abdominal wall. The colored mammies of those days practiced a semblance of asperis, by folding a four inch square of cotton sheeting twice and burning a hole in the tip by holding in a candle. The cord was then passed through the hole made in this manner. The cord dressing was then applied. Either Balsam Peru and Castor Oil or powdered Boric Acid. The former kept the cord moist too long, causing considerable delay at times before it dropped off, whereas, the boric acid would become lumpy from the watery constituents of the cord and prove a source of irritation. It is the general custom now to cut the cord short, and if any dressing is used at all it is simply gauze wet with alcohol. A flat clamp is placed on the cord about $\frac{1}{2}$ inch beyond the umbilicus and the cord doubly ligated in this depression with narrow tape, another ligature having been placed 2 or 3 inches away, the cord is clipped just beyond the first ligature and the stump touched with Tr. Iodine before putting on the cord dressing of plain gauze. The end of the cord is swabbed with Iodine to prevent the entrance of infection as a number of cases are on record of infants dying of such infections as disclosed at autopsy. Williams reports several in his service.

Secondary bleeding from the cord is an annoying and dangerous occurrence as the new born baby cannot stand much of a blood loss. It was an easy thing in former years when the cord was ligated within 2 or 3 inches of the abdomen for the nurse to be instructed to put on a secondary ligature if there was oozing or bleeding from the original tie. With the very short stump left at present it is rather more difficult to retie as in most in-

stances the stump of the cord must be transfixed with a heavy silk cord on a sterile needle and tied on both sides as with a thick pedicle. I have had no experience with separate ligation of the vessels of the cord, the Ziegler clamp and other methods advocated from time to time. The method described is so simple and safe that I have considered it useless to complicate the matter. The cord should always be clamped or ligated towards the placenta also, because if the blood is allowed to drain away, it will be more difficult to expel the collapsed placenta than if it is distended with blood and occasionally an undiagnosed twin may bleed to death through the open end of the cord. Upon this principle is based a recent method of promoting the expulsion of a retained placenta. When the simple methods of expulsion have failed then 30 to 60 c. c. of sterile normal saline solution are injected into the vessels of the cord. An area on the cord is painted with Iodine and with a sterile Luer Syringe introduced into the umbilical vein as it is seen coursing around, the outside of the cord the saline solution is slowly injected until the vein is distended. The distention of the placenta following upon this will generally cause a sudden contraction and expulsion of the retained mass. This simple measure should be given a trial before resorting to a manual removal of the placenta.

The cord usually drops off within 5 or 7 days after delivery. There should be no tugging on the cord to expedite this but alcohol gauze dressings may be used to promote it if there is unusual delay. If there are excessive granulations or a purulent discharge from the stump after separation then daily applications of 10% Sol Argyrol should correct this. In ordinary cases the belly band may be discarded after the cord drops off, but if there is a considerable protrusion it is well to continue its use until any danger of an umbilical hernia is over. In spite of all precautions or perhaps on account of the lack of them, umbilical hernia will occur after the attentions to the patient are over. In most instances the protrusion is slight and will respond to the simple adhesive dressing. Two strips of Z. O. adhesive are applied to the abdomen from below upwards, crossing at the umbilicus and overlapping the skin. This treatment continued for 2 or 4 weeks will cure the simple cases. If the condition is extreme then radical surgical measures must be resorted to.

ACUTE ABDOMEN*

By C. C. HOWARD, M. D., Glasgow.

The history should include:

1. Sex, (a) M—, (b) F— (a) Menstrual history.

2. Age includes: Child, Adult, Old.

3. Pain includes: When did it begin? Where located? How severe? Has it ceased? Did you take Morphine? Intermittent or continuous? Did you have cough with it? Early or late?

4. Vomiting: Does it stop or is it continuous?

*5. Gas: Pass any gas since pain began, loud enough to be heard well? Hear any rumbling?

6. Voiding: Is it painful? frequent? None?

7. Miscellaneous: Any chill or fever? Similar attacks or not? Trauma? Any diarrhea?

Clinical examination should include:

1. Inspection: (a) Expression, (b) Breathing—Ala Nose, (c) Restless or quiet, (d) Coughing, (e) Abdomen flat or distended, (f) Any Eruption—Shingles.

2. Palpation: (a) Does each side of Diaphragm move freely? (b) Rigidity—Where? (c) Tenderness, (d) Masses, (e) Hernial openings.

3. Percussion: (a) Dullness—Does it shift? (b) Tympany.

4. Auscultation: (a) Tinkling. (b) Rumbling—Is it connected with pain? (c) Explosion—Where?—Obstruction, (d) Still as the Tomb—Peritonitis.

5. Vaginal: (a) Cervix—Soft or hard, is it very tender? opened or closed, (b) Uterus—Size, location and movability, (c) Cnldesac—Free or mass, (d) Lateral—Tender, masses or free.

6. Rectal: (a) Sphincter—Relaxed or tight, (b) Tenderness, (c) Mass.

7. Laboratory: (a) Urine, Blood, Pus, (b) Blood, W. B. C., R. B. C., Hbg., Wassermann—Tabes.

Differential diagnosis should include:

1. Child: (a) Pyloric Obstruction, (b) Intussusception, (c) Congenital Abnormalities, (d) Pneumonia.

2. Adult, male: (a) Appendicitis, (b) Renal Colic, (c) G. B., (d) Perforated Ulcer, (e) Obstruction, (f) Acute Pancreatitis, (g) Tabes or Herpes.

3. Adult, female: (a) All the above with these added, (b) Tubal Pregnancy, (c) Abortion, (d) Salpingitis.

4. Abdomen: (a) Cancer if obstructive symptoms—Rectum, Sigmoid or Cecum.

I have outlined a system that has helped me

a great deal in caring for the Acute Abdomen, will pick out a few points from the chart.

1. Perforated Ulcer: Severe pain, marked rigidity upper half, don't delay, the first 8 hours is your golden opportunity to save this patient.

2. Ruptured Tubal Pregnancy: Most often missed one period, severe pain lower half, rigidity, often shock if hemorrhage is severe, slight dark vaginal discharge, don't rush into abdomen during shock, morphine and saline in breast, they will usually come back within 12 to 24 hours, then operate.

3. Always palpate the kidney and microscope the urine, many an innocent appendix has been amputated for a little stone in the ureter.

4. Acute Appendix: Pain, early vomiting which ceases, rigidity in appendicial region, slight temperature, operate early, don't wait to see if it will rupture.

5. Salpingitis: Moderate pain in pelvis, bilateral, usually vaginal discharge may be positive or negative, vaginal examination tender laterally, tide them over until the fire goes out.

6. Obstruction: Continuous pain with continuous vomiting, unable to pass gas with enema, Paroxysmal rumbling heard with stethoscope, operate at once, if late* put catheter in bowel under local.

7. Remember that it is a double burden on your patient and very humiliating to the doctor to remove a normal appendix when the little fellow is suffering from pneumonia. Use your stethoscope and if necessary x-ray the chest.

8. Chills: Rarely does any illness in the abdomen that demands immediate surgery begin with a chill. Always think of pneumonia, kidney, gall ducts or septic abortion.

9. Trauma: Always ray abdomen for free gas around diaphragm, also inflate bladder with air under fluoroscope.

10. Use those attributes which God gave you, your brain, eyes and fingers, they will make 90 per cent of your diagnoses.

Interposition Operation for Prolapse of Uterus.

—Baer and Reis present an analysis of nine-one consecutive inter-position operations for prolapse of the uterus. Of the patients who were subsequently examined from five months to seven years after operation, 92 per cent were cured. There was one death, a mortality of 1.1 per cent. The operation is selected for those patients with a large cystocele, and a corpus uteri neither too small nor too large, freely movable and without gross adnexal disease. Cervical amputation or repair is essential in the perineal body is most important for the success of this procedure.

*Read before the Muldraugh Hill Medical Society.

METHODS OF DETERMINING THE FACTS ON WHICH AN ACCURATE UROLOGICAL DIAGNOSIS RESTS*

By THOMAS M. DORSEY, M. D., Louisville.

It has been my privilege and satisfaction to be a member of the University of Louisville Medical Faculty and Director of the Dorsey Urological Clinic, for many years; and in that relationship I have been brought into intimate contact with the most pressing problems of today—and tomorrow—in medicine, its scientific development, its research, the relation of the specialist to the general practitioner, and the creation of impressive and effective instrumentalities for medical service. I cannot help seeing—could not help it if I would—how many-sided are contacts and how manifold and complex are the general practitioner's ramifications in medicine.

There is no field of human endeavor in which integrity bears a greater relation to the medical profession than in the specialist's relationship to the general practitioner. The specialist's clinic is wholly dependent for its growth and its success upon establishing relations with physicians of good character. In turn the general practitioner must rely on the integrity of the specialists for the quality of his work.

The aim of this paper is to present clearly and concisely the methods of determining the facts on which accurate urological diagnosis rests. Time-honored fallacies of yesterday in the nature of vague and indefinite "alibis" for symptoms to which for lack of knowledge we were unable to assign physical causes no longer obtain, since by virtue of modern urological investigations we have been able to trace them to their real sources.

The term urology includes all the medical and surgical diseases of the urinary tract in both male and female, and the genital organs of the male. Urological examinations entail much care and system to avoid diagnostic errors and to determine the extent to which the parts concerned are involved. With modern instruments of diagnostic precision, such as the microscope, urethroscope, cystoscope, roentgen-ray, and the various laboratory procedure at our disposal, guess-work in the diagnosis of lesions involving the genito-urinary tract is unnecessary. The best methods of examining the patient in brief are as follows:

History: The "complaint" should be a complete statement of everything of which the patient complains. The family history is first recorded. This is important to show any possible relationship between hereditary tendencies and the disease or lesion from which the

patient is suffering. The question of family tuberculosis malignancy and nervous disorders should be given careful consideration. Record of the personal and past history of the individual is useful in determining whether the habits, previous diseases or injuries have any bearing upon the conditions found. The history of present illness relates to the patient's statements and not the physician's findings. Infectious diseases, such as measles, mumps, diphtheria, scarlet and typhoid fever, should be noted, and also the genito-urinary sequelae if any. Tuberculosis and focal infections should be considered, as they play an important role in the development and treatment of renal and prostatic lesions. Record the complications resulting from gonorrhea, with its multiplicity of symptoms. In the female inquire into the relation of sterility, pelvic operations, miscarriages and stillbirths.

Present Illness: Investigate the function of the genito-urinary organs. Note disorders of urinary production, elimination, micturition, sexual power, desire, ejaculation, impotency, sterility, etc. The effects of genito-urinary disease on the nervous and cardiovascular systems and the gastro-intestinal tract should be carefully considered. The period of incubation, mode of onset and progress of the disease are then recorded. The onset is noted in days, weeks, months or years, and whether development was sudden or gradual. If the patient has pain, record is made of where and when, whether sharp, dull, constant or intermittent, and whether it radiates or remains localized. Pain must not be confused with tenderness; the former is spontaneous, the latter elicited only by pressure or movement. Pain is often a misleading symptom. Pain in the back is not an important sign of renal disease; in fact it is more apt to be due to other causes than kidney disease. Furthermore, in quite a number of cases where one kidney is affected, pain will be referred to the side on which the other—healthy—organ is situated. Pain is the one symptom, however, which invariably brings physician and patient together. Many patients have serious symptoms, such as hematuria for example, and still refrain from seeking medical advice until pain develops, and then it may be too late. Pain during urination, with or without increased frequency or urgency, requires careful analysis and investigation. Without going into details, let it suffice to state that the trouble is more apt to be in the posterior urethra than in the urinary bladder.

A discharge from the urethra may appear as the result of a fresh infection with Neisserian organisms, but very often it represents a chronic infection which shows repeated

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exacerbations. In many instances the patient believes himself to be suffering from a fresh acute attack, whereas, the fact is that it is an old case suddenly activated by certain causes, such as over indulgence in coitus, alcohol, etc. Purulent or muco-purulent discharge represents the products of infection within the urethra. When inquiry is made regarding previous Neisserian infection, the patient not infrequently asserts that "several years ago he had a slight strain which gave little or no trouble." Such a history cannot be dismissed lightly. This mild infection may have been the starting point of the disease for which the patient now presents himself.

If a urethral discharge is present the character, consistency and color are recorded. The peculiarities of urination are noted, as to nocturnal or diurnal frequency, etc., and if pain is present whether it occurs at the beginning, during or following micturition, where located and whether radiating or stationary. The patient is asked if he has ever been catheterized or sounded, and whether the urinary stream is normal in size and force, also whether blood or "gravel" has ever been voided, and if the urine causes burning during its passage. We note whether the individual has complete control over the voiding of urine. If serious disease is suspected, the patient is questioned about night sweats, loss of weight, cough, disturbance of memory, peculiarity of gait, etc. In every case a positive or negative history of venereal disease is recorded, and special features, such as hematuria, noted.

A person may acquire luetic infection just as readily as he can specific urethritis; in fact, he may have both at the same time. A Wassermann test may throw some light upon cases of tabes where urinary symptoms are conspicuous. In connection with syphilis of the genito-urinary organs, we will state, for the sake of completeness, that the kidney may rarely be affected, while the external genitalia are quite commonly involved. The primary lesion on the penis is too well known to warrant further description. Nodules in the form of gummata are often encountered in the testicle and epididymis. These nodular infiltrations are characterized by being painless. A blood Wassermann and gonococcus fixation tests are made as routine in all cases.

Remarks: The progress of the disease, depth, character and mode of invasion should be recorded. Involvement of the posterior urethra, prostate, urinary bladder, seminal vesicles, epididymes, the general circulation, heart, joints, etc. should be noted. Chronic infiltration of the genito-urinary system should be elucidated, and the complexity of irritative, painful, sexual, inflammatory and obstructive symptoms noted. Urinary in-

fections are either descending or ascending in origin. The history should show the course of the disease, the etiology, former treatment and results. Note if the present symptoms are due to instrumentation, and if the onset was with chills, fever, irritation, pain, etc. Note particularly the progress and mode of invasion. Record the loss of renal function, the presence of toxemia, the development of systemic symptoms, uremia gastro-intestinal and cardio-renal manifestations, pyrexia, chills, malaria, loss of weight. Obstructive uropathy and its development should be noted. The signs of change from benign to malignant disease should be recorded, such as pain, hemorrhage, metastasis, etc. It is important in diseases of the urinary bladder to know the frequency, force and character of the urinary stream, and whether pain occurs during micturition. Such symptoms may be due to submucous cystitis, tuberculosis or calculi.

At this point I desire to emphasize the importance of gentleness in genito-urinary examinations. Many physicians seem to have the idea that gentleness is effeminate. The thoughtful student of medicine realizes the necessity of avoiding trauma. Treatment rooms should be free from virulent organisms. Such precaution will prevent complications and sometimes fatalities. Cultivate a delicate touch, acquire the "hidden secret" of gentleness, instead of emulating the venturesome tactics of those who use the puncturing, pushing, spreading and probing instruments. The physician has to deal with germs along the urogenital canal and organisms of a pathologic nature that remain after the infection has subsided or apparently disappeared. To traumatize the tissues in instrumental manipulation means the lowering of nature's defense mechanism. The physician must consider the subject of mental and nervous traumatism through fright, fatigue, fear, shock, apprehension, anxiety, and general anesthesia. These causes which produce depression of tissue resistance and pave the way for local infection, cannot be ignored by the physician who would attain a high level of results. By gentleness the sphincteric sentinel of the urinary bladder, which through dread has become as adamant as the fortifications of Verdun, can be relaxed. Many physicians attempt, as they say, genito-urinary work. How they have the temerity so exactly to express it is difficult to understand when one sees their results.

Physical Examination: We now come to the physical examination of the patient which must be carefully and systematically made. The use of sketches and charts is important in showing lesions of the penis, urethra, scrotum and its contents, the rectal findings, etc., and cystoscopic pictures greatly facilitate ex-

planation of the case. Photographs and roentgenograms are necessary. Record is made of the general physical aspect of the patient, his strength and vigor. The temperature, pulse rate and blood pressure are noted. With the patient in the standing position the abdomen is examined, the kidneys palpated, and any mobility, enlargement, induration and tenderness are detected. With the thumb beneath the ribs in front and the fingers in the loin behind, grasp the intervening tissue and as the patient breathes the lower pole of the kidney is palpated. Masses connected with the kidney move downward on inspiration. The patient is then placed in the recumbent posture and the kidneys palpated bimanually for the purpose of detecting renal enlargements caused by neoplasm, calculi, hydronephrosis, and prolapse of the organ. Muscular spasm and contraction in the presence of acute affections are elicited by light palpation. Such muscular spasm may effect the lateral abdominal wall, the lumbar muscles, or the entire side. The region of the quadratus lumborum muscle is of importance, as muscular rigidity there may be present as one of the signs of a kidney lesion not detected by more general palpation. Lumbar tenderness is a sign of acute inflammation of the kidney. In some instances the entire lumbar region is so affected, in others there is a small area of lumbar tenderness in the region of the last three ribs or in the costovertebral area. Sinuses or fistulae in the renal or vesical region are noted if present. From the urological standpoint, we must search for evidence of lues about the head, face, mouth, lymph glands, body, extremities, the anus and surrounding areas for condylomata, etc. The general condition of the patient is noted, whether good, anemic, emaciated or jaundiced.

The external genitalia, composed of the penis, scrotum and its contents, are next examined. Note the length of the prepuce, its retractability and presence or absence of paraphimosis. Careful inspection is made of the meatus urinarius, it being opened to see whether or not there is a discharge. The glans is examined as to conformation, epispadias, hypospadias, aberrant ducts, and stricture of the meatus. The shaft of the penis is inspected, and then the inguinal regions for the presence of sinuses, herniae, undescended testicles, etc. The scrotum, testes and epididymes are carefully examined and palpated. All abnormalities are noted if present, such as hydrocele, phimosis, paraphimosis, enlargement, inflammation, erosion, epididymitis, cysts, induration, nodules, adhesions, painful areas, sinuses and varicocele. When ulcers are present we note the number, appearance, and whether the surface is clean, suppurating or indurated, and the location.

The affections of the external genitalia of importance are: Gonorrhea, chancre, chancre, simple ulcers, venereal warts, condylomata, balanitis, balanoposthitis, and inguinal adenitis resulting from chancreoid or other superficial ulcers and herpes. While it is true that urethritis resulting from the Neisser micro-organisms is most frequently encountered we must not lose sight of the fact that some of the most stubborn and persistent cases are due to chancreoid infection. Chancre is the initial lesion of syphilis and not being frequently associated with chancreoid there is ordinarily a tendency to overlook leucic invasion, because the clinical picture is so typically chancreoid. Such an error on part of the clinician may be obviated by establishing the invariable rule that excretion from all superficial lesions shall be examined by dark field illumination or staining to prove the existence or exclude the possibility of syphilis.

All lesions on the external genitalia are regarded suspicious until proven otherwise by a blood Wassermann test regardless of the dark field findings.

The glandular system is examined in all cases to determine whether the glands are enlarged, discrete, confluent, painful or tender, infiltrated, fluctuating or ulcerating, whether the enlargement is unilateral or bilateral, the number of glands involved, their size, arrangement, consistency, color of overlying integument, etc.

Should there be a discharge from the meatus, it is examined as to color, whether slight or profuse, and a smear is made and examined microscopically for bacteria. In morphologic characteristics the gonococcus and micrococcus catarrhalis are practically identical. In quarantining a patient remember that no one can positively differentiate between them by staining and the diagnosis can only be perfected on the basis of cultural findings.

If the patient is a male, he is directed to urinate in three glasses, two ounces in the first, two ounces in the second, and the remainder in the third. These samples are inspected macroscopically and examined microscopically and chemically. It is noted whether the urine is cloudy or clear, or contains shreds which float or sink, and whether other pathological elements are present—mucus, pus, blood, tissue or gravel. We observe whether the patient has difficulty in starting the stream, whether it is normal in size, whether it dribbles, twists, or passes freely. The total 24-hour urine is secured for quantitative examination. In health the average amount of urine passed in 24 hours is about fifty ounces. The volume voided is influenced by diet and the amount of fluid ingested. A fresh specimen is secured for qualitative ex-

amination, as metabolism during sleep is less than during working hours. A complete chemical and microscopical examination should be made immediately after voiding.

Rectal examination: In the presence of urethritis, unless it is very acute, we should not overlook the importance of careful examination of the prostate gland. This is for the purpose of ascertaining whether prostatitis exists, and if so the extent of the involvement. The prostate is investigated in every case, except in acute epididymitis and very acute urethritis. The prostate excretion after massage is examined microscopically for bacteria, pus cells, lecithin bodies, spermatozoa, etc. A careful investigation will often give information of prostatic lesions from which symptoms have not arisen. Examination of the prostatic excretion is very important and affords a valuable working index.

Examination of prostate and seminal vesicles: By means of the index finger, covered with a finger-cot and well lubricated, massage the prostate and seminal vesicles gently. The expressed material which escapes from the meatus should be caught in a sterile dish. This expressed excretion may show numerous organisms and will explain many cases of urethritis which may have been in existence for years. Even if the drippings in the dish fail to show germs, we still have at our disposal another method of discovering such germs prior to instrumentation. Immediately after the massage the patient is told to urinate into three glasses. The third specimen consists only of a few drops and will contain pus, mucus, leucocytes, organisms, spermatozoa, etc., which until that time had been retained in the posterior urethra by mere lack of sufficient volume to flow outward. Exploration should be conducted before the bladder is emptied, and again after its contents have been evacuated. It is intended to ascertain the general outline and size of the prostate gland, its consistency, elasticity and any irregularity of its surface. Nodulation may be produced by carcinoma, sarcoma, periprostatic inflammation, abscess, fibrous infiltration, etc. Note the condition of the anus, the presence of fissures, hemorrhoids, strictures; examine the anal sphincter for strength, tonic and flaccid; inspect the rectal wall for ulcerations, polyps, tumors, compression of the rectal lumen by external lesions, etc. Such lesions produce urinary symptoms.

Without using force the index finger of the left hand—leaving the right hand free to draw charts, record diagnosis, etc.—is gently passed over the prostate to note enlargement, the condition of its surface, induration, tenderness, adhesions, or involvement of adjacent structures. Note whether the notch at the upper end and the furrow along the median

line are normal, absent, or deep, whether the gland tissue on palpation is normally elastic or indurated. Note areas of tenderness if any be present, length of prostate, contour, whether smooth or nodular, adherent, etc. If prostatic calculi be present crepitus will be noted. The normal seminal vesicles are soft and disappear on pressure, their consistency being that of a finger-cot filled with water. The examination should be lightly and gently conducted and a delicate touch acquired when investigating indurations, adhesions, enlargements and tender areas in the seminal vesicles and adhesions of adjacent structures.

EXAMINATION OF THE GENITALS IN THE FEMALE

Inspection: Labial swellings are suspicious of Neisserian infection of Bartholin's glands. Look for gonorrheal maculae of Sanger at the orifices of the glands. Abscesses are also common in this region. These lesions must be differentiated from pudendal tumors, hernia, and labial edema from whatever cause. Note lesions of the external genitals if such be present,—chancre, chancre, eczema, condylomata, etc. Palpate the inguinal glands for enlargements the same as in the male. Separate the vulva, note whether the perineum is intact, examine for cystocele and rectocele. If there is no visible discharge from the urethra, secure sample from the canal and make microscopical examination of smears. Note whether there is pouting, swelling or redness of the external urinary meatus. Prolapse of the urethral mucosa and caruncles are very common.

Bimanual examination: Note the position of the cervix and uterus, size of uterus and degree of tenderness. Palpate the tubal and ovarian regions.

Examination with speculum: Inspect cervix for erosions, lacerations, primary lesions, etc. Make smears of secretions of the cervical canal and examine microscopically.

Instrumentation (in the male): The patient voids urine before instrumentation. A soft rubber catheter is introduced to detect residual urine if any and the amount. In case of distortion of the urethra or elevation of the floor due to enlarged prostate, a rigid olivary type, elbo-type of single or bicoud variety or the guyon director, may be used. Measurement of the urethral length is obtained by moving the catheter backward and forward until the point where the flow begins is determined, from which point the urethral distance is measured on the catheter when it is withdrawn. By using a catheter marked with gradations the length of the urethra may also be satisfactorily determined. The normal urethra is between 18 and 20 centimeters (7 to 8 inches) in length, and any marked elongation signifies just that much lengthening of

the prostatic portion. Bougies-a-boule in varying sizes are used to explore the urethra. As the instrument passes, note roughness, irregularity, constriction, or complete arrest.

Generally speaking, the diagnosis of prostatic hypertrophy by means of measures is not a difficult matter. Of greater importance is appreciation of associated conditions, the size of the growth and its general direction, inflammation of the bladder due to infection, overdistension, atony, and the presence of such complications as vesical calculi and marked renal involvement. The size of the growth is determined by rectal examination and intravesical palpation. This question may have a bearing upon the choice of operation. Infection and inflammation of the bladder are recognized by the symptoms and by urinary examination.

Overdistension and atony when revealed by exploration with the catheter signify the existence of back pressure of prolonged duration. The opposite condition of contraction and limited vesical capacity is the result of unusual irritability caused possibly by a tumor, foreign body, calculus, or by deep inflammation and pericystitis, in which event it has a bearing upon the prognosis or the degree of relief that may be expected from operative intervention.

The foregoing procedure should be followed by introduction of the sound, size 26 French or smaller. If the average sized sound meets with obstruction a stricture must be present. A stricture is an abnormal narrowing or contracting of the lumen of a canal or passage, and of course we here refer to the urethra. While strictures may occur anywhere in this canal, the usual site is about the bulbomembranous section. Strictures are classified as: (a) congenital, (b) traumatic, (c) inflammatory, and (d) spastic. Before the sound is removed the urethra is palpated for areas of induration, nodulation, granulation and inflammation. We are dependent for diagnosis upon the history of the case, which includes injury and infection, and in addition urinary frequency, difficulty, incontinence and dribbling urination, accompanied by pain. These patients almost invariably have mucopurulent urethral discharge not infrequently associated with blood.

To determine the location and degree of stricture we must resort to inspection, palpation and instrumentation. The sound, bougie-boule and filliform represent the mechanical armamentarium. When using a metal instrument it is best to begin with a large one and diminish the size if required. When sounds are employed we do not use an instrument smaller than a No. 18 French. A filiform that cannot be passed in the usual manner may be introduced through the urethroscope,

followed by a Harrison whip. The endoscope is used as a diagnostic agent for the detection of the following types of pathological lesions: Polyps, Congestion, Ulceration, Neoplasms, Constriction, Cysts, Granulations, Urethral abscesses, Strictures, Size, shape and general appearance of the verumontanum, Areas of edema, pouches and sinuses.

The following regions are carefully examined: Fossa navicularis, Glands of Littre, Orifices of Cowpers glands, Orifices of ejaculatory ducts, Sinus peculiaris, Crypts of Morgagni.

Tests for functional activity of the kidneys: As it is the altered function of a diseased kidney that measures its menace to the patient's health, and as the functional disturbance is the first definite indicator of anatomic changes, much thought has been given to the methods which seek to ascertain whether the kidneys are working normally and to measure their degree of insufficiency. Such tests afford invaluable aid in the study of renal and extrarenal diseases; and they also furnish a useful guide to prognosis and treatment. When the kidneys functionate adequately they extract from the blood certain waste products which are excreted in the urine. When the kidneys become diseased and degenerative changes take place, it is natural to suspect a commensurate and paralled decrease in the functional activity of these organs (there being however, occasional exceptions to this rule).

The chemical study of the blood in disease has recently interested the clinician. Technical methods have been introduced and so many facts of clinical application have been gathered that chemical examination plays an important role in urology. Among the most useful of these are the estimations of urea, uric acid and creatinin in kidney diseases. It is customary to divide the nitrogen-containing constituents of the blood into two groups, one including the proteins (albumins and globulins), and the other including the various nonprotein nitrogenous substances (unutilized food derivatives, waste metabolic products, etc.). Because of the light which they throw on the problems of metabolism and excretion it is the nonprotein group, particularly the waste products, urea, uric acid and creatinin, which are of chief interest from the clinical point of view.

Cystoscopy: Cystoscopy is at the present day a practical procedure. The interior of the urinary bladder was be explored by a visual apparatus. While systoscopy is essentially a method of examining the bladder, it also shows the vesical aspect of the prostate and through inspection of the ureteral orifices and the urine coming from the ureters, it aids in diagnosing diseases of the kidneys. The

following are the abnormalities found in the interior of the bladder on cystoscopy:

Cystitis: acute diffuse, acute cystica, chronic diffuse, chronic cystica, membranous, encrusted. Trigonitis, urethritis, bulbous edema, etc.

Prostate: medium bar, hypertrophy, malignancy, abscess, fistula, sinus.

Tuberculous bladder, ulcers any type, hemorrhage, neoplasms, celloules, submucous hemorrhage, diverticula, bas fond, varicosities, calculi, trauma, foreign bodies.

Vesical orifice: pressure, irregular, anemic, contracted, dilated, congested, cystocele, rectocele, neoplasms, obstruction, contracted or dilated bladder, fistula, tuberculosis, etc.

Ureteral abnormalities: kinking, torsion, displaced, double, stricture, dilated, absent, etc.

Remarks: Collect urine from both kidneys direct by cystoscopic catheterization and have laboratory analysis made. Note the amount of urine excreted in fifteen minutes from each kidney, and total amount excreted in one hour.

Fulguration: Fulguration is indicated in benign papilloma, ulcers of the bladder, to enlarge strictured ureteral orifices, to remove impacted calculi in the interval portion of the ureter, and to stop bleeding points.

X-Ray-Pyelography: Urography is the outlining of the kidney, ureter and bladder by the injection of thorium through the ureteral catheter before radiograms are made. The roentgen-ray is used to outline the normal pelvis and ureters; to diagnose hydronephrosis; to determine pelvic capacity; to diagnose deformity of pelvis or ureter as in double kidney; to diagnose and locate stricture, kinking torsion, pressure or obstruction; to diagnose renal tumor; to depict renal calculi of too little density to otherwise be shown; to diagnose early tuberculosis; to locate renal calculi in relation to the pelvis.

The foregoing paper embodies my conception of the type of urological examination most useful to the overtaxed health counselor. It is concise, practical and modern. It represents an effort to achieve the requisite completeness, logical arrangement, possesses the virtues of simplicity and teaching value.

Use of Radium from Surgical Point of View—

Matti relates his experience with the use of radium, from a surgical view-point, to the treatment of malignant tumors of various organs and tissues and of their metastases. Some very outstanding results were seen in carcinoma of the prostate, tongue, rectum, tonsil, prepuce, breast, larynx, stomach etc.; lymphosarcoma, thyroid tumors, tumors of the mediastinum, etc., and metastases of all of these.

THE IMPORTANCE OF EARLY RECOGNITION AND OPERATION IN ACUTE APPENDICITIS*

By STERLING B. HINTON, Franklin.

In any discussion involving acute appendicitis, it is but fair to state that during the last decade probably more has been written regarding acute appendicitis than any other subject in the entire category of either medicine or surgery. And, notwithstanding that fact, the percentage of pus cases encountered at operation has not decreased in proportion to the preponderant amount of medical literature appearing on that subject.

While there is no particular age or race immune, acute appendicitis occurs more frequently at ages between five and thirty-five, more common in the male than in the female, more prevalent in those that are heavy consumers of meats and alcohol, more frequent in those who are particularly disposed to arthritis, tonsillitis, sinusitis, or other types of focal infection; there seems to be a predisposition to the geographic distribution of the disease, being more prevalent in cities than in the rural districts, and some one has suggested, the author I do not now recall, that it is particularly most prevalent in and around surgical centers.

The history of acute appendicitis is pain, which in the majority of cases occurs in the peri-umbilical or epigastric region. The pain is followed by nausea and vomiting in sequence, which usually ceases when the pain is referred to the anatomical location of the appendix; the location of the appendix is in approximately sixty per cent of the cases, lateral to or behind the cecum and ascending colon, and points upward and in that event the pain is referred to the cecal region to the loin, and high up; in about thirty per cent of the cases the appendix is located, either in the false or true pelvis and points downward, and in that location the pain is referred low down in the right abdominal quadrant, and slightly to the left; in the remaining ten per cent of the cases the appendix is located beneath the apex of the cecum or along the mesial side of the ascending colon beneath the terminal mesentery, or ilium, pointing upward or downward, and in this position the pain is referred to the region of the cecum, either low down or high up, dependent on the direction the free end of the appendix points.

The onset of pain, either mild, medium or severe, the direction the pain is referred, is by no means an infallible guide, but a careful study of same gives the surgeon a fairly accurate degree of knowledge upon which he bases his conclusions as to the relative anatomical location of the appendix, and influence;

*Read before the Third District Medical Society at Bowling Green.

to a certain degree the type incision made, or the method of approach in his efforts to remove same.

The most important physical signs in acute appendicitis are tenderness and muscular rigidity over the position corresponding to the anatomical location of the inflamed appendix. The tenderness and muscular rigidity are possibly more consistent than any other symptom or physical sign in the entire symptomatology of acute appendicitis, and unquestionably more frequently harmonizes with the direct proportion of pathological changes occurring in the appendiceal wall, found at the time of operation; before there is exudate from the appendix into the surrounding tissue, the tenderness is marked but not excessive; having the patient take a deep breath while making gentle palpitation, then cough, will excite pain at the point of the maximum appendiceal inflammation; should the pain on gentle palpitation become exquisite, it is regarded by many leading authorities as being a positive sign of pus, and by many as a more valuable sign than leukocytosis; and here again the position of the appendix exerts a marked influence on the physical sign of tenderness. Should the appendix lie retrocecal and deep-seated, the process of eliciting localized tenderness is somewhat obscured, but if the appendix lies in close proximity to the anterior parietal peritoneum the question of eliciting localized tenderness is comparatively simple.

Fever, which exists during the course of appendiceal inflammation, varies considerably; though usually interpreted as being less dependable than many other symptoms of acute appendicitis; it at least lends some evidence as to the virulence of the infection present, the amount of pathological changes occurring in the appendix and adjacent tissue, and can be considered as a fair index to the degree of toxic absorption and the combined resistive faculties of the patient, though this fact must be kept in mind, that some times, for causes not satisfactorily explained, patients whose charts show no excessive temperature fluctuations, and who, by reason of more impressive symptoms and signs, submit to operation, are found to be suffering from a character of appendiceal inflammation which would have in the ensuing few hours become fulminating or gangrenous in character.

The leukocyte count in acute appendicitis is a rather important laboratory adjunct. Most authorities stress particularly the polymorphonuclear count, more especially in the extremely toxic cases, a fairly high and rising leukocytosis is significant of infection somewhere. When the leukocytes run from fifteen to twenty thousand, with polymorphonuclear eighty-five to ninety per cent, it is accepted

by many as being indicative of the beginning invasion of the infective processes into the peritoneum; when the leukocyte count drops with a corresponding increase in the polymorphonuclear count, it is generally accepted as a diffuse peritonitis; however, notwithstanding the accepted value of a careful blood count, the practice of waiting for the blood picture to verify your clinical findings and to postpone or delay operation awaiting confirmation of the laboratory technician is a practice that does not bear out justification and which means in many instances the difference between a clean, simple appendectomy, and pus formation, with the attending possibilities of complications, increased surgical hazards, and a high rate of mortality.

In conclusion, I would state that if possible the first twenty-four to thirty-six hours following the onset of acute symptoms is the ideal time for operation; however, this cannot always be done. The systematic administration of morphine, which oftentimes becomes necessary, carries two fallacies; first, it somewhat obscures the possibilities of an early and accurate diagnosis; second, by placing the patient temporarily at ease it renders him less susceptible to operative submission; should the case pass through the first few days with rupture, pus formation, and peritonitis the best method to pursue cannot be put into print; each individual case then becomes a case for surgical judgment, and many times taxes the resources of the best surgical clinics; some contend an immediate operation, others wait an interval, at any event all will agree that if you do operate, establish free drainage, remove the appendiceal mass if you can do so without sacrificing Nature's protective walls, and in the event of doubt, and if one is to err in either direction it is better to do too little than too much, for in the final analysis, it is not the appendicitis that yet carries a rather high surgical mortality, but the subsequent peritonitis.

Creatine and Creatinine in the Urine of Children.—In fiftythree normal children and in eighty-seven children with various diseases, the excretion values for creatine bodies were determined. In tuberculosis the values always increase, especially in the presence of fever. If the condition continues serious for some time, the values tend to decrease while the rate per body weight tends to increase. In nontuberculous febrile pulmonary diseases, there is an increase over the normal average, and during convalescence and chronicity a decrease. The amount of retine bodies excreted increases as the age advances.

AN UNUSUAL CASE

By G. H. FREEMAN, Plano.

Miss M., fifteen years of age, was taken with a small ulcer on inside of lower lip about February 10th, this did not seem to be giving her any trouble much for a few days. On February 14th she was seen by a doctor that thought she had an acid condition of the blood and stomach, at this time she had a slight measlie looking rash on her chest, also a slight redness of the conjunctivas. She steadily grew worse with mouth, eyes and the eruption a little more marked, and I saw her on the 18th at the time she had a slight fever with eruption on limbs and chest, with slight conjunctivitis; mouth had two or three small ulcers inside of the lower lip a reddened congested condition of the mucous-membrane of the buccal cavity and on the 22nd I saw her again, at that time she had marked conjunctivitis, sore mouth confined to the inside of lower lip and gums, temperature 102 degrees. I do not remember the pulse, but they were considerably accelerated with considerable mucous accumulation and a very foul odor. The 24th and the 25th continued to grow worse rapidly with more mucous or rather muco-purulent secretions from the mouth, the eyes at this time running a sanguino-purulent discharge profusely, the eruptions marked on chest, arms and lower extremities. On the night of the twenty-fifth, she had a hemorrhage under every nail both toe and finger nails and by 10 a. m. on the 26th, there was a discharge of a bloody character from some of the nails. About this time, (26) blisters began to form on her hands and around the genitals. By the 27th or 28th the toe nails were running (not all of them) a sanguino-purulent discharge, by the 28th the eruption was very marked, giving a very rough appearance almost as rough as if covered with small warts and finally this eruption came off in the form of scabs. The eyes ran very profusely for several days. The mouth, very sore and offensive for several days. By March 1st or 2nd, the skin began to come off of her chest and back, this skin would not have an accumulation of water under it, it just seemed to slip off just like it was in a state of decay, this continued for several days all of the time having a bad odor. Nearly all of the skin on the body came off and by the 25th to 28th of March, the hands and feet had lost all of the skin and nearly all of the nails and she continued to live until April 4th at 3 p. m. Before she died the fat in the orbital cavities had broken down and run out or been absorbed, this caused the eyeballs to fall back into their orbits, giving a skellatinous appearance. The feet and hands seemed to be almost in a state of de-

composition before she died. The body so badly broken up and decomposed, the undertaker could not embalm it.

In all there were nine specimens sent to the laboratories to see if we could arrive at a diagnosis, but no satisfactory diagnosis was reached.

We might say that four doctors saw this case and all admitted that they had never seen anything like this before.

The Wassermann was negative.

BOOK REVIEWS

TEXT BOOK OF UROLOGY. For students and practitioners, by Daniel N. Eisen-drath, M. D., Attending Urologist Michael Reese and Chicago Memorial Hospital, Assistant Professor of Surgery, Rush Medical College of the University of Chicago, and Harry C. Ralnick, M. D., Associate Urologist Mt. Sina Hospital, Adjunct Urologist Michael Reese Hospital. 700 black and white illustrations and 11 in color. J. B. Lippincott Company, Publishers.

This volume supplies a need for a text-book in Urology, which presents the subject in a clear simple manner and it readily meets the requirements of the rapid advance this subject has made in the last ten years.

The diagnosis and treatment of diseases of the urinary tract in both sexes and of the male genitalia have been given in complete details, and as a whole the book is a valuable guide for the general practitioner and for such workers as those who have chosen urology as a specialty, it is especially helpful.

IMPERATIVE TRAUMATIC SURGERY

—By C. R. G. Forrester, M. D., F. A. C. S.

The author, from his wide experience in this phase of surgery, is well fitted to write just such a volume, and he has accomplished his purpose.

As eighty per cent of all traumatic surgery is done by the general practitioner, it is easy to see that he should avail himself of such an opportunity as this text affords, to study and apply those methods of treatment that have been demonstrated to be most practical.

This text is written along entirely new lines as is demonstrated by, first, the handling of fractures and dislocations which are not given classical attention but such treatment as can be applied at once with expectation of best end results; and second, by the emphasis placed on prognosis which in all instances covers the "time of disability" as well as the "forecast of outcome." The author has included a most illuminating and explanatory series of 598 illustrations. Paul B. Hoeber, Inc., Publishers, 76 Fifth Avenue, New York City. Price, \$10.00 net.

WOMAN'S AUXILIARY NOTES

CALLOWAY COUNTY ORGANIZES

The Woman's Auxiliary to the Calloway County Medical Society was organized at Murray on May 7th. Mrs. V. A. Stilley, Benton, Councilor for the First District in the State Auxiliary, assisted with the organization. Fifteen charter members were enrolled. Officers chosen were: Mrs. J. V. Starke, Kirksey, President; Mrs. E. B. Houston, Murray, Vice-President; Mrs. C. H. Jones, Lynn Grove, Secretary-Treasurer and Mrs. J. H. Coleman, Historian. Mrs. W. C. Melugin was elected chairman of the program committee for the ensuing three months.

PERRY COUNTY ELECTS OFFICERS

The Woman's Auxiliary of the Perry County Medical Society met at Hazard on May 18, 1929 and elected the following officers for the ensuing year: President, Mrs. J. P. Boggs, Hazard; Vice-President, Mrs. Dana Snyder, Hazard; Second Vice-President, Mrs. Manuel Ray, Allais, and Secretary-Treasurer, Mrs. B. M. Brown, Hazard.

WHITLEY COUNTY ELECTS OFFICERS

The Woman's Auxiliary of Whitley County met in Corbin on May 22, 1929 and elected the following officers for the ensuing year: Mrs. G. H. Buck, President; Mrs. J. H. Parker, Vice-President; Mrs. B. J. Edwards, Secretary; Mrs. W. C. Bryant, Treasurer.

PRESIDENT'S REPORT WOMAN'S AUXILIARY

Jefferson County Medical Society, Louisville,
Kentucky. Annual Meeting, June 3rd, 1929

Mrs. G. A. Hendon

Madam Chairman and members of the Woman's Auxiliary to the Jefferson County Medical Society:

Just to remind you—"The object of the Woman's Auxiliary to the Jefferson County Medical Society shall be to extend the aims of the medical profession through wives, daughters, mothers, sisters and widows of the doctors to other organizations which look to advancement in health and education; to assist in entertaining at County, State and District Society meetings; to promote acquaintanceship among doctors' families that local unity and harmony may be increased."

Due to the fact that it supplies a demand for the co-ordination of effort along lines of achievement in both public and private health progress, not known to exist until this organization began to function, the Woman's Auxiliary to the Jefferson County Medical Society has made itself not only a decided factor, but a deciding factor in the affairs of the State Medical organization.

Our organization has acquired a paradoxical position, in-as-much as its function has revealed the existence of certain needs in affairs of health, by offering certain facilities for which

there had been no apparent demand. The usual order of things was thereby reversed in that the supply created the demand instead of the demand creating the supply.

On account of the essential nature of the Auxiliary it has become a vital factor in State medical affairs and we, its members, should be conscious of its responsibilities as well as its power. We should realize its opportunities and privileges as fully as its duties and obligations.

By reason of its numerical strength and metropolitan situation the Jefferson County Auxiliary is expected to establish the standards of accomplishment and set the pace of Auxiliary progress for the entire state. Every member should at all times be thoroughly alive to this very responsible and important position and thereby become stimulated to renewed activity and greater energy.

There should be a definite program adopted indicating the self imposed tasks which it will be the privilege of this organization to perform during the coming year, and I would respectfully submit the following:

1st. A more strenuous membership drive. Every member of the Jefferson County Medical Society should have at least one representative in this organization.

2nd. Use your influence collectively and individually in your clubs for health education and sanitation. It would not be difficult to secure at least one health program during a club year in any club of which you are a member.

3rd. If you have any plan for an attractive or illuminating program, confer with the President who, I am sure, would be delighted to co-operate with you.

4th. Carefully study and preserve the lessons of the Study Course in the Health Laws of Kentucky and United States Public Health Service which have been coming to you regularly and which are of great value, not only at the present time but in the future. This Study Course was devised by our State Body, the Woman's Auxiliary to the Kentucky State Medical Association, and distributed with the co-operation of the United States Public Health Service and the State Board of Health.

Now, to hastily review the past year—we have had printed and mailed to every doctor in Jefferson County and every dentist in Louisville, a letter outlining our drive for and requesting subscriptions to *Hygeia*—a magazine so well worth while. Our efforts in this were not crowned with signal success.

Our constitution and by-laws was completed, printed and mailed to each member.

We also initiated the plan of mailing to each member a printed statement for dues, as so many were complaining that this had been neglected. As dues had been paid in various months, it really is difficult to remember just when they are due. March is now fixed as the

beginning of our fiscal year.

Your President attended the meetings of the Woman's Auxiliary to the American Medical Association held in Minneapolis, June 12-16, 1928 and of the State Medical Association in Richmond, September 10-13, 1928 with much pleasure and profit.

Our drive for membership in December under the able leadership of Mrs. J. K. Freeman, resulted in adding forty-five new members to our roll.

February 1st we sponsored a card party at the Woman's City Club Rooms to secure funds for Easter entertainments for children at the City Hospital and Kosair Hospital, and for other Auxiliary expenses.

On March 14th, your President was invited to attend a conference held in the City Hall to discuss the need of supplying school lunches to undernourished children, of which there are more than 2,000 in Louisville, and the Woman's Auxiliary voted to cooperate to relieve this situation and to contribute the sum of \$25.00 as an evidence of good faith.

At a subsequent meeting it was decided that the Family Service organization, with the aid of visiting teachers, would meet that need this year and that steps would be taken to secure an appropriation from the City with which to provide one warm meal each day for these children in our schools.

At our March meeting the Jane Crawford Memorial Fund was discussed after hearing Mrs. A. T. McCormack's splendid address on the subject. Two of our members, Mrs. J. N. McCorrack and Mrs. Irvin Abell each subscribed fifty dollars to the cause.

On April 30th this organization was very well represented at the May Day Child Health Day dinner at the Brown hotel.

And now that my term of official service is completed, it is with a feeling of gratification that I review the pleasant associations and lasting friendships that have grown out of the connection I have been permitted to enjoy.

I desire to thank each member and especially the Officers and Chairmen of Committees who have so loyally supported my efforts during the year, and bespeak the same co-operation for my successor in office.

Respectfully submitted,
(Mrs. G. A.) JESSIE P. HENDON,
President

BOOK REVIEWS

A TEXT-BOOK OF SURGERY—By W. Wayne Babcock, A. M., M. D., F. A. C. S.

The author, believing that the requirements of the under-graduate parallel those of the practising surgeon, has written this text to supply the needs of both. He has done this by correlating and systematizing the ad-

vanced practice of surgery.

The book is divided into four parts viz: Part 1, General Surgery; Part 2, The Surgery of the Systems; Part 3, Surgical Technique; Part 4, Regional Surgery; and in this way he has thoroughly and successfully brought out that knowledge which the student and practitioner are eager to acquire. W. B. Saunders Company, Philadelphia and London. Price, \$10 net.

THE HEART IN MODERN PRACTICE—By William Duncan Reid, A. B., M. D.

This is a book that should be in every doctor's working library. The heart, a most important organ, is one that has to be watched very carefully by all practitioners, in both health and disease. Dr. Reid has prepared a volume which is no doubt the most concise and most complete on the heart. To be able recognize the abnormal, one must know the normal and this the author has taken great pains to do.

The sections on the electrocardiographic examination of the heart and that on the etiological types of heart disease, the thorough, easily comprehended, and interesting. J. B. Lippincott Company, Philadelphia. Second edition, revised. Price, \$6.00.

PEDIATRICS—For the General Practitioner. By Harry Monroe McClanahan, A. M., M. D.

This is a book written expressly for the general practitioner, to give him the modern clinical picture of the diagnosis, treatment, and management of the diseases of infants and children as he will encounter them in his daily practice.

In order to make this volume most complete, the author has begun with a thorough discussion of the normal infant and child through to the period of adolescence. The physician, knowing the normal, is better able to appreciate the abnormal.

A few of the chapter headings will aid one in judging the scope of this volume; Birth Injuries, Congenital Malformations and Defects, Diseases of the Newborn, Breast and Artificial Feeding, Specific and Contagious Diseases; as well as many more subjects of equal importance.

Throughout the entire book, Dr. McClanahan has written as though he were discussing the subject with you, carefully evaluating the various methods of treatment. It is indeed a very interesting volume. J. B. Lippincott Company, Philadelphia.

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COUNTY SOCIETY REPORTS

Cumberland: At a meeting of the Cumberland County Medical Society, held on February 8th, 1929, Dr. J. E. Bow was elected President; Dr. W. F. Owsley was elected Secretary and Drs. W. C. Keen and H. G. Davis delegates to the annual meeting of the Kentucky State Medical Association.

W. C. KEEN, Secretary.

Scott: Scott County Medical Society met at City Hall, Thursday, February 7th, at 5 p. m., with Dr. J. W. Baird, president, presiding. Following visitors and members present. Visitors, Dr. Grabor, Dr. Massey, of Lexington and Dr. Taylor, of Bethany, Owen County; members, Dr. J. W. Baird, Dr. E. A. Anderson, Dr. H. V. Johnson, Dr. W. S. Allphin, Dr. William Mason.

Minutes of previous meeting read and approved. The committee to draft resolutions for Dr. F. C. Collins, reported and resolutions were read by Dr. Johnson.

No further old business, we were delightfully entertained by an excellent paper by Dr. Grabor, of Lexington, on "Auricular Fibrillation," which was discussed or rather many questions asked. It was a very valuable paper.

No further business, meeting closed.

A. STEWART, Secretary.

Franklin: The society met in regular monthly session Thursday, January 3, 1929.

Dr. C. E. Youmans, the retiring president, presided.

Members present were: Drs. John Patterson, R. B. Ginn, J. W. Wilson, F. M. Travis, C. E. Youmans and L. T. Minish. Owing to the influenza epidemic, our attendance was small.

A letter was read from Dr. John P. Stewart in which he declined to accept the presidency for 1929, owing to the fact that it had been but a short time since he had served as president. Dr. Patterson was then elected president for 1929.

The committee appointed at the December meeting on location of the U. S. Government Hospital made its report which was accepted and the committee discharged.

Dr. J. W. Wilson was the essayist and he presented to the society a most interesting paper on the subject of Diphtheria. The essayist showed that he had given careful thought to his subject, his paper was freely discussed by all members present.

The secretary was instructed to accept the Deshell Laboratories offer to show to the society at its February meeting a motion picture of the Alimentary Tract.

The society then adjourned and retired to the Capital Hotel dining room, where the retiring president, Dr. Youmans, entertained the members with a luncheon.

L. T. MINISH, Secretary.

McCracken: The year just passed has been one of the best for the McCracken County Medical Society. We had a good attendance all through the year, and interesting meetings. We lost two of our fine members by death, Drs. C. H. Johnson and H. T. Rivers, both of whom were loyal, active members and a distinct loss to the profession in Paducah.

Our March meeting was a special Tuberculosis meeting and fine papers were read by Drs. H. P. Sights and E. B. Willingham. These doctors have made special study of tuberculosis and their discussions were entertaining and instructive.

At the March meeting the society adopted a resolution providing for financing the healthiest boy and girl in McCracken county for a trip to Lexington to compete with the healthiest boy and girl from other counties in the state.

One of the most interesting meetings ever held by the society was our November meeting when Dr. Gant Gaither, of Hopkinsville, addressed the society by invitation, his subject being "A Critical Study of the End Results of Gall Bladder Surgery." Dr. Gaither reported a series of 164 gall bladder operations, going into detail and discussing the various questions incident to gall bladder surgery, viz. cholecystotomy, cholecystectomy, drainage, immediate closure, after treatment, simultaneous intra-abdominal surgery, especially appendectomy, hemorrhoidectomy, dental work, for pyorrhoea and uterine and perineal work in the female.

Dr. Gaither's address was a real scientific as well as an intellectual treat to the members and met with hearty applause and approval.

The annual election of officers of our society was held at the December meeting. Dr. E. W. Jackson was elected president, Dr. J. T. Reddick, secretary, re-elected, and Dr. P. H. Stewart, treasurer, re-elected. Drs. Frank Boyd and O. R. Kidd, delegates.

Respectfully,
J. T. REDDICK, Secretary.

Caldwell: The Caldwell County Medical Society held a meeting in connection with a dinner in honor of the eightieth birthday of Dr. Z. T. Cunningham, at the Hotel Henrietta, Princeton, on Wednesday evening, January 23rd, 1929. The dinner was given to Dr. Cunningham by his daughter, Mrs. Hallie Watt, and the physicians of the county were invited as the guests of the occasion. Following a four-course dinner, the retiring president of the county society, Dr. Linton, called the society to order and the election of officers for the year 1929, was held. The following were elected: Dr. Z. T. Cunningham, president; Dr. W. C. Haydon, vice-president; Dr. W. L. Cash, secretary-treasurer; Dr.

I. Z. Barber, delegate to State Association; Dr. J. M. Moore, alternate delegate. Dr. W. C. Haydon, Dr. W. P. Morse and Dr. L. O. Young were elected members of the Board of Censors.
W. L. CASH, Secretary.

MEETING OF THIRD DISTRICT MEDICAL SOCIETY

The Third District Medical Society met with the Christian County Medical Society at Hopkinsville on Tuesday, May 21, 1929 at 11 a. m.

We were the guests of Dr. E. L. Busby, Supt. of the Western State Hospital, who served a delightful luncheon at 1 o'clock to the seventy-one doctors, who were present from the Third District, from the adjacent counties in Kentucky and from Clarksville, Tenn., and the surrounding territory.

The first order of business was the election of officers, which was as follows: President, Austin Bell, Hopkinsville; Vice-president, B. S. Rutherford, Bowling Green; Secretary, Jno. H. Blackburn, Bowling Green.

It was decided to hold the next meeting of the Third District meeting at Glasgow in August, the date to be decided later.

Reports of Clinical Cases

Dr. S. S. McReynolds, Russellville, reported a case of melanosis or melanosarcomatosis, the primary pigmentation having existed for fifteen years, the spreading of the melanomata having occurred within the last two years and generalized pigmentation of the skin having existed for sometime. Dr. McReynolds had this patient, white, male, age 40 years, present and the case aroused a good deal of comment and discussion.

Dr. B. E. Boone, Elkton, reported a case in a white, female, age 69 years, who had typhoid at 32 years and who had been during recent years exposed to three cases of active pulmonary tuberculosis in her family. This lady was first seen 10 days ago with a temperature of 103°, pulse 50, pain in the left side and a tentative diagnosis of pleurisy. Within the 10 days the temperature varied from 98 to 103°, there had been a hematuria for two days followed by melena for two days, this followed by the development of crepitant rales over the left chest and finally a solidification of the left lung. The pulse had gradually increased from 50 to 110, varying somewhat with the temperature range.

The question as to whether this might be a case of miliary tuberculosis or a pneumonia led to considerable discussion by Doctors Hughes, Bryan, Bell and Boone.

Dr. O. N. Bryan, Nashville, read a paper on "Essential Hypertension" which was discussed by Doctors Dade, Stone, Rutherford, Pope, Honaker and Bryan.

At this time the luncheon was served to the seventy-one doctors present and was thoroughly enjoyed by all.

Following the luncheon, Dr. Curran Pope, a member of the State Board of Control, made a talk, in which he discussed the status of the inmates in the different eleemosynary institutions and in which he advised a bond issue of five million dollars by the State of Kentucky be made for the improvement of these institutions.

Dr. T. D. McKinney discussed the "Treatment of Head Injuries" in which he spoke of the marked increase in these injuries in recent years due to the increasing number of automobile accidents.

Dr. McKinney insisted that all of these injuries should be considered as serious and kept under observation until such time as they could be considered out of danger. He further stressed the fact that the injury to the bone was not the significant feature in head injuries, but rather the brain structures.

He then discussed cerebro spinal fluid circulation and the vascular circulation in the brain, demonstrating the manner in which the interference to the circulation would lead to the development of certain symptoms and certain pathological changes in the brain.

Under the treatment of these injuries Dr. McKinney insisted that the modern treatment consisted in absolute rest, putting the patient to bed and treating the shock that usually existed, stressing the fact that in early diagnosis many of the cases were mal-treated by transfusion, the making of x-ray, etc., which in many instances aggravate the existing shock. He further stressed the importance of an intelligent nurse, who could make accurate observations as to the condition of the patient. He gave as indications for immediate operation (1) hemorrhage from the meningeal artery (2) depressed and compound fracture (3) Focal signs present and persistent to relieve the intracranial pressure. He advised the use of glucose intravenously or magnesium sulphate by mouth or per rectal. He further discussed spinal puncture as a treatment, calling attention to the serious dangers attendant upon its routine use, stressing the point that spinal puncture should always be under a control manometer.

This paper was discussed by Dr. Pope from the standpoint of the neurologist.

Dr. Curran Pope presented a paper on "Observations Upon Some Every-Day Neurological Problems" in which he called attention to the commoner diseases of the nervous system met by the general practitioner. This was a very practical and comprehensive paper and will no doubt be of material benefit to this society.

The Third District Society, after discussion, went on record as favoring the Nurses Training School in small hospitals as conducted at present, asking that the State Board of Examiners for nurses continue with their former requirements rather than encouraging the attendance

of nurses from the small hospital in the large metropolis.

A rising vote of thanks was tendered Dr. Busby for the delightful entertainment, after which the society adjourned.

JNO. H. BLACKBURN, Secretary

BOOK REVIEW

INTERNATIONAL CLINICS—Volume 1, Thirty-ninth series, March, 1929. Edited by Henry W. Cattell, A. M. M. D., of Philadelphia. A quarterly of Illustrated Clinical Lectures and especially prepared original articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology-otology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners.

Papers of practical interest in this volume are, one by Dr. Lewellys F. Baker on "The Nature and Treatment of Maladies that cause Headache," and one by Dr. Simon Flexner on "Specific Prevention and Treatment of Poliomyelitis." Published by J. B. Lippincott Company.

Eclampsia.—Rossenbeck tested the serum as to its organic tonic condition in four cases of eclampsia, in two cases of hephropathia gravidarum, and in one case of epilepsy. He found that the chlorine was raised from 10 to 15 per cent above its normal value, and the sodium had fallen 20 to 25 per cent below normal. Potassium was, in some of the cases, normal, in the remainder just under normal. Serum from the case of epilepsy showed a strikingly low potassium value. Calcium, in the whole series of cases, fluctuated between the upper and lower limits of normal. The normal excess of sodium over chlorine had disappeared and had been replaced by an absolute excess of chlorine over sodium. In view of recent investigations, one might conceive of the convulsions as a kind of effort of the organism at self-cure by increasing alkalosis to protect itself against complete paralysis of metabolism in the tissue. Phosphoric acid and lactic acid are set free by every muscle contraction. Both these acids, the great increase of which in eclamptic serum is well known, could be drawn into the tissues for the neutralization of the accumulated sodium and make it possible for this to travel back into the circulating blood. At the same time, the threatened overacidification of the circulating blood could be combated by the increased washing out of the phosphoric acid in the form of secondary phosphates. It is to be hoped that a causal therapy may grow out of research on the subject of eclampsia.



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KENTUCKY MEDICAL JOURNAL



THE N.Y. ACADEMY
OF MEDICINE

AUG -9 1929

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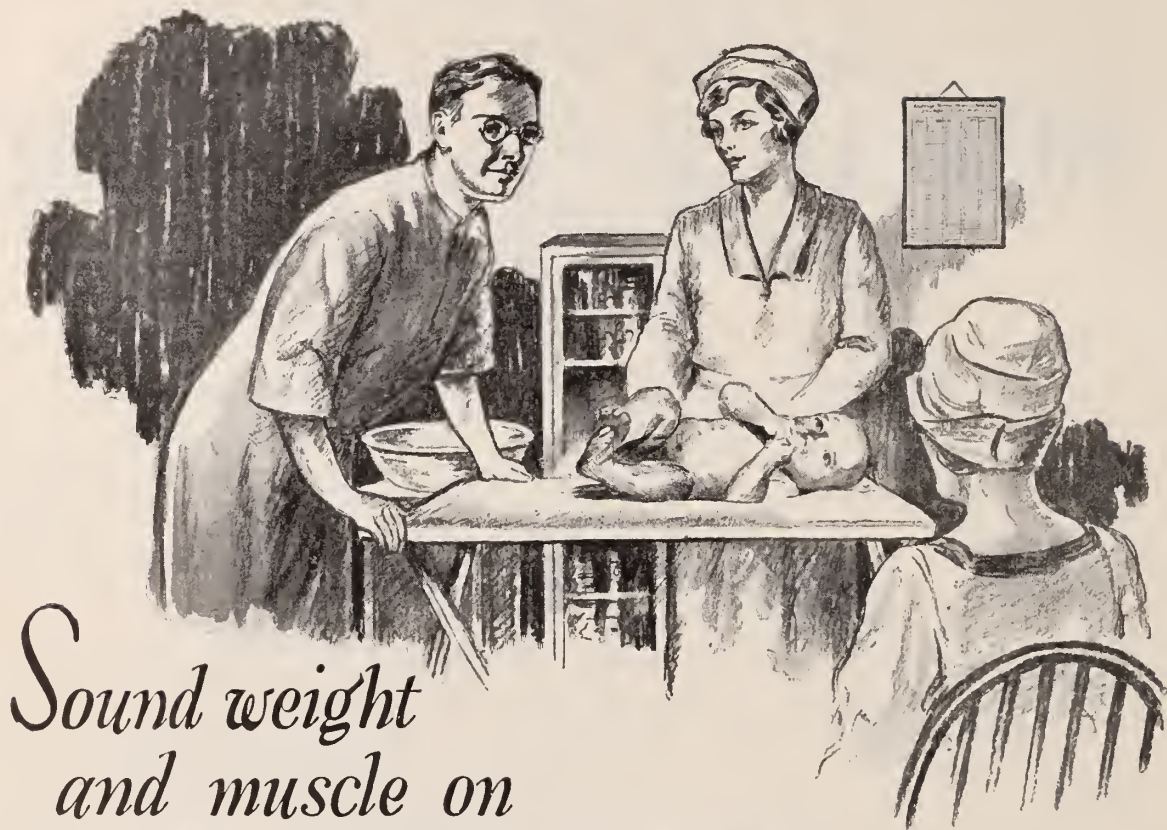
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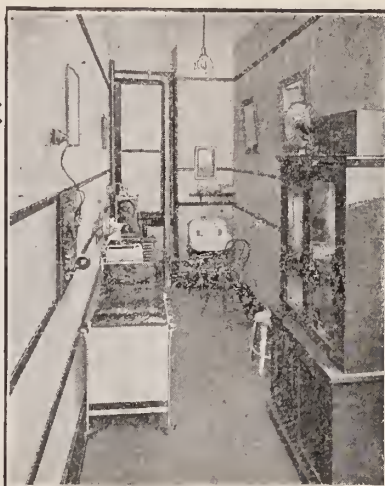
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EDITORIAL

THE ANNUAL MEETING

The date for the Annual Meeting was selected by a committee from the Jefferson County Medical Society, the Secretary of the Louisville Publicity League, and the President of the Association.

October 21, 22, 23 and 24 was chosen as the time most convenient to Louisville, for the city has become a great convention city, and the committee wished to select a time when no other convention was being held, so as to avoid hotel congestion.

The Roof Garden of the Brown Hotel has been chosen as the place of meeting, and upon this floor will be the registration booth, commercial and scientific exhibits, and lounging rooms.

Make your hotel reservations promptly to avoid confusion.

THE SCIENTIFIC EXHIBIT

One of the best features of our Annual Session will be the Scientific Exhibit of Tularemia, prepared under the auspices of the Kentucky State Board of Health, by Dr. C. N. Kavanaugh, of Lexington. This exhibit contains mounted colored glass plates, similar to x-ray plates, of all the different phases of the disease, as well as the photographs of all the insects that so far have been suspected of transmitting the disease. Dr. Kavanaugh has been over two years collecting and preparing this exhibit.

The Laboratories of the State Board of Health will have technicians and instructors on duty all during the meeting to explain the work of this department.

There will be several x-ray exhibits given by members, who are specialists in this field.

The Association is endeavoring to make these scientific exhibits attractive and instructive, and spaces are available for any hospital, clinic or physicians who have anything of interest they wish to present to the profession.

THE WOMAN'S AUXILIARY

The ladies have this year adopted as their slogan, "Take Your Husband Along to Louisville," and many are planning to escort their husbands to the Annual Meeting.

The ladies are invited to participate in the golf tournament, and all the clubs are open to

our members by paying the usual green fee.

Mrs. D. A. Bates, President, and Mrs. G. A. Hendon, Chairman of Entertainments, of the Jefferson County Auxiliary, are planning many attractive events for the pleasure of the visiting ladies.

MEDICO LEGAL DEFENSE

For many years the Kentucky State Medical Association has defended its members against unjust malpractice suits, under the able guidance of Hon. Fred Foreht, Louisville, who is the association's general counsel.

Dr. J. B. Lukins, Louisville, has been chairman ever since the resignation of Dr. J. J. Moren, and the Secretary, Dr. A. T. McCormack, is an ex-officio member of this committee.

If any claims are made against a doctor in good standing in his county medical society, he should immediately get in communication with our counsel and chairman. Many of our best physicians and surgeons have been annoyed by unjust suits, and we have been unable to help them because they failed to keep their membership in their local society.

If you have not paid your dues this year, do so immediately, so as to receive the Journal which will contain items of interest regarding the Annual Meeting.

If you have allowed your dues to lapse, you cease to have medical defense protection.

THE CLINICAL CONGRESS AND THE EIGHTH ANNUAL MEETING OF THE AMERICAN COLLEGE OF PHYSICAL THERAPY

Chicago has again been selected as the annual meeting place for the clinical congress of physical therapy of the American College of Physical Therapy, which will be held at Hotel Sherman, Chicago, November 4-7, 1929. The consensus of opinion of the many representatives who have attended the sessions in the past few years, is that Chicago offers the most attractive features for a large medical gathering. Convention facilities are unsurpassed. Chicago as a medical center needs no apology. The experience of those who have attended any of the previous conventions speaks well for a highly successful 1929—Clinical Congress.

One of the novel features to be inaugurated this year is the clinical part of the program.

One half of each day will be devoted to a variety of clinics in the sections on Medicine, Surgery and allied specialties, and Eye, Ear, Nose and Throat. As in the past, there will also be a joint meeting of all sections for the presentation of numerous addresses of interest to all physicians irrespective of their specialties. Education in physical therapy will be thoroughly stressed, as the time has come when this phase of the subject must be given due emphasis by an organization such as the American College of Physical Therapy. Scientific papers, clinical addresses, demonstrations of technique, and scientific and technical exhibits, will comprise the remainder of a scientific program which merits the attention of all those interested in the newer fields of medicine. Attendance at the congress is not limited to the fellows of the College, as all duly licensed physicians, their technicians and assistants, properly sponsored, are cordially invited to attend all the sessions.

Physical Therapy has now reached a very definite status in the practice of medicine, and ethical practitioners throughout the country are always interested in the progress which is usually manifested at a session such as that conducted by the American College of Physical Therapy.

Program and other information may be obtained by writing to the Executive Offices, American College of Physical Therapy, Suite 716 30 N. Michigan Avenue, Chicago, Ill.

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The development of the shock-proof x-ray unit is considered as probably the most important contribution to x-ray science since the advent of the Coolidge Tube. The knowledge and experience gained during these many years are reflected in the design of this new apparatus. Nothing has been left undone to bring to a realization the finest piece of workmanship, in justice to the important role to which it is believed this apparatus will be assigned in future radiology. It is dedicated to that body of specialists, the roentgenologists, who have so immeasurably contributed to the advancement of medical science.

ORIGINAL ARTICLES

CONGENITAL DISLOCATION OF THE HIP*

By ORVILLE MILLER, M. D., Louisville.

Dislocation of the hip is the most frequent of all the dislocations found in the newborn, and is of very common occurrence.

Statistics gathered by Hoffa, Putti, The Milan Polyclinic, The Vienna Institute and the Hospital for Ruptured and Crippled show a great preponderance of females presenting this condition. The percentage of female cases shown in these statistics vary from 81.6% at the Hospital for Ruptured and Crippled to 87.2% according to Hoffa. The dislocation is more often unilateral than bilateral in proportion of about 60% or 65%, the left hip being more frequently involved.

Various theories have been advanced as to the causation of this disability, among them being, the position that the child occupies before birth; trauma during birth; an extraordinary laxity of the capsule of the joint in the female, as well as the more perpendicular plane of the pelvis in the female. The last two seem to be the more plausible since the condition is found so much more frequently in the female than the male.

Many of these cases may be at the beginning merely sub-luxation, which afterward is transformed into a true dislocation because of the laxity of the ligamentous structures and capsule of the joint when weight is borne on the hip. The almost perpendicular plane of the pelvis presents little resistance to the luxation which very easily and rapidly becomes a true dislocation upward of head of the femur.

A vast majority of the cases are of the posterior superior type, the head of the bone resting on the ilium posterior and superior to the acetabulum, the capsule being elongated and thickened where pressure is made on it, between the head of the femur and the pelvis. The ligamentum teres, if present, is elongated and thread-like in structure. In children past three or four years of age it is seldom found at all. The capsule may become constricted in its mid-portion and of almost a cartilaginous nature at that point. In a great many cases the head of the femur becomes pear-shaped and somewhat flattened at the point of contact with the ilium and a false acetabulum may be formed above the true acetabulum by the constant pressure of the femur. The acetabulum may be shallow, and in children five years of age or over, may be partially filled with fat and fibrous tis-

*Read before the Jefferson County Medical Society.

sue, so that even if a reduction is accomplished the head will not remain in place. The acetabulum frequently assumes something of a triangular shape, or pear-shaped appearance because of the absence of pressure by the head of the femur to maintain its normal outlines. The shaft of the femur may be twisted so that the head of the bone is turned backward as much as forty-five degrees. All the muscles of the thigh gradually become shortened and the gluteal muscles are contracted. The Y-ligament of Bigelow is also altered in its appearance and structure.

These patients usually present a group of symptoms that are more or less characteristic. There is a gait, which, when the condition is unilateral, is of a lunging type. When the weight is borne on the affected side, the body seems to sag somewhat, giving one the impression of instability in that extremity. Falls are frequent because of a weakness in the hip. There is also present occasionally, when the patient is standing, a curvature of the spine, when the lesion is unilateral. Because of the sag of the pelvis on the affected side, measurements of the lower extremities may show a shortening of as much as one or more inches on the affected side.

When the condition is bilateral there is usually a well defined lordosis in the lumbar spine. There is a distinct widening of the hips, and the patient has a peculiar gait which may resemble that found in a progressive muscular dystrophy. When the patient is placed on an examining table and the thumb placed over the femoral artery as it emerges from under Poupart's ligament, and the femur rotated by the other hand, the absence of the head of the femur under the thumb and its presence under the fingers in the gluteal region is easily discerned.

These patients frequently complain of fatigue, and sometimes pain in the region of the hips, from comparatively small amount of exertion.

The diagnosis presents no difficulty. The history of limp and weakness first noticed when the child began to walk, with the gradual appearance of widening of the hips and an increase of the lumbar lordosis, all of which have come about without any local injury or disease, is pathognomonic.

It may be differentiated from coxa vara (a condition rachitic in nature), by the solidity of the joint found upon close examination; for there is no abnormal range of motion downward or upward when traction or upward pressure is made on the thigh. Perthes' disease produces a slight amount of limitation of motion rather than an abnormally free range of motion. Tuberculosis of the hip is of gradual onset, following an injury usually and produces a decided limitation of motion.

In both of these last mentioned conditions the x-ray shows their typical alterations in and about the head of the femur.

A posterior dislocation is frequently found following an acute infectious arthritis of the hip or an epiphysitis of upper end of the femur. The history of acute illness with acute pain, redness, swelling, heat about the hip and subsequently a discharge in the region of the hip; scars found in the middle or upper portion of the thigh and the absence of the head of the femur upon examination by x-ray, are sufficient evidence for diagnosis.

Accompanying progressive muscular dystrophy there is frequently a gait similar in character to that found in congenital dislocation of the hip. Other signs such as abnormally enlarged calves of the leg with abnormal weakness in the hypertrophied muscles combined with actual atrophy of muscles of the trunk and upper extremity, afford an easy differentiation between the two types of disability.

The principles of the modern treatment of congenital dislocation of the hip dates back to 1888-1890. In 1888 Poggi replaced the intact head in the deepened acetabulum by open operation and Paci of Pisa, originated a method of reduction by manipulation. Previous to this time resections of the head of the femur and deepening of the false acetabulum had been done with more or less unfavorable results and attended with a high mortality rate. In 1890 Hoffa improved the open operative methods but with still unsatisfactory results. Lorenz made further improvements on both the open method and the closed, and the bloodless operation of Lorenz is founded on the methods used by Paci and the open procedure known now as the Hoffa-Lorenz operation is founded on the principles instituted by Poggi in 1888.

In children under five years of age the Lorenz bloodless reduction should be used in preference to any other method. Experience has shown that the majority of patients at this age in life have an acetabulum that is deep enough to be useful, without alteration and that it is possible to perform a reduction by this procedure. Once the head of the femur is replaced, however, fixation must be applied to maintain reduction until the ligamentous and soft structures have become adjusted to the new state of affairs. The limb should be held in abduction in such a manner as to offer further resistance to a recurrence of the dislocation and the patient should be encouraged to bear weight on the extremity as soon as possible. By weight bearing, the acetabulum is deepened as has been shown by x-ray, atrophy of the bones making up the joint is hindered and equal growth of the limbs progresses.

It is sometimes necessary to apply traction to an extremity for some time previous to the reduction by this method. Especially is this true where the patient has had no treatment and where the entire musculature of the thigh is shortened in comparison with the normal. Considerable weight is necessary to bring the head of the femur down to the level of the acetabulum in such cases. Fifty pounds is not too much if a Buck's extension apparatus is used. With skeletal traction good results may be had with half as much. Countertraction must correspond with traction so that nothing is lost by the patient sliding toward the foot of the bed. It has been the author's practice to use a Thomas splint, fastening the distal end to the foot of the bed firmly so that the upward pressure of the ring on the tuberosity of the ischium equals the downward pull on the femur. Ice tongs are used for the skeleton traction.

When the head of the femur has descended to the level or somewhat below the level of the acetabulum as shown by an x-ray picture taken with a bedside unit without disturbing the traction, the patient is removed to the operating room for operation. Under general anesthesia, with all muscles thoroughly relaxed, the patient is firmly grasped at the pelvis by an assistant. The opposite thigh is fixed or held so as to maintain countertraction while the affected side is abducted and thoroughly stretched until all resistance offered by the adductor muscles is overcome. While the thigh is being forcibly abducted, relaxation may be hastened by forcibly striking the inner side of the thigh with the outer border of the hand.

The gluteal and the tensor fascia femoris are also stretched by forcibly adducting the one thigh across the other. The flexors are overcome by hyperextension until no further resistance is encountered. Next the knee is extended and the thigh flexed on the abdomen and forcibly stretched until the foot is made to lie over the shoulder on the same side and the entire extremity in contact with the anterior surface of the torso, while the opposite extremity is held in complete extension against the surface of the operation table. Traction is next made on the thigh in such a manner as to bring the head to the level of the acetabulum but posterior to it, the thumb or a wedge of padded wood is placed behind the trochanter, and using the thigh as a lever, the head of the femur is forced over the rim of the acetabulum into the joint. There is frequently a jar or snap accompanying the reduction. With the thumb placed over the femoral artery, the head can be felt in place and when the thigh is rotated with the other hand.

Occasionally, in spite of the thorough relaxation of the soft structures, reduction is not

accomplished. In such instances, a plaster of Paris spica applied and allowed to remain, holding the thigh in wide abduction for a period of two weeks, may be a great aid in a successful reduction at the second attempt.

Once the head is replaced in its normal position, the thigh is completely abducted so that the knee lies in a horizontal plane with the long axis of the body, so as to lock the trochanter against the rim of the acetabulum and prevent a redisplacement while plaster of Paris is applied to reach from the upper portion of the leg, including the hip and the lower border of the ribs.

It is needless to say that the older the patient is, the more difficult will be the task of reduction.

Some writers consider it almost useless to attempt the bloodless method after the patient has reached the age of five or six. The trend, in fact, of later years has been inclined toward the open reduction, even in patients where the closed method might have yielded satisfactory results.

Because of the ease with which the joint may be approached, the small amount of hemorrhage encountered and the complete exposure obtainable, the Smith-Peterson incision seems to be the most popular at this time. An incision is made from the anterior superior spine of the ilium, downward to below the level of the trochanter and the sartorius and the tensor fascia femoris muscles are separated and the dissection carried backward through the inter-muscular plane. The incision in the skin is next carried backward from the anterior superior spine following along the crest of the ilium to a point somewhat posterior to the projected long axis of the femur. The muscular attachments on the outer rim of the ilium are dissected loose and the further dissection downward is carried out sub-periosteally until the acetabulum is finally reached. The capsule of the joint is incised, a lever introduced into the acetabulum, the head of the femur engaged and thus forced into its normal position. Any abnormality of the joint socket is corrected just previous to the reposition of the head or else immediately afterward, in the case of a very shallow acetabulum.

Hoffa enlarged the shallow joint by the use of sharp spoons, the Doyen instrument, a burr which has a perfectly smooth head eliminating the danger of passing the instrument through the joint into the pelvis, is used for enlarging the joint.

Albee and others have constructed an overhanging shelf of bone at the upper rim. In this way producing an effect of a greatly deepened socket. With a broad chisel, a large section of bone, which includes the rim of the acetabulum, is separated from the ilium and

bent to overhang the head of the femur. Small pieces of bone from the tibia are wedged between the cut surfaces of the ilium to stabilize the buttress.

In adults it is usually impossible to accomplish reduction by any known method. Operations to stabilize the hip have been devised by König, Lance and Lorenz and used and modified by Clark, Albee, Smith-Peterson, Frank Dickson and others.

The operation just described above (the osteoplastic buttress) was first used by König. By the employment of this principle the secondary acetabulum which has been worn in the ilium by the constant pressure of the head of the femur above the acetabulum is deepened and the joint rendered stable.

The bifurcation operation devised by Lorenz is useful in adults when there is pain in the hip. The femur is divided obliquely down and outward, beginning just below the neck in the inner side and extending downward to about three or four inches below the greater trochanter. The fragments of the bone are completely separated. The upper end of the lower fragment is inserted into the acetabulum and the lower end of the upper fragment brought into contact with the lower. The patient is placed in a plaster spica and union of the fragment allowed to take place.

The Whitman reconstruction operation is also recommended for this condition. With either of the methods an increase in the shortening of the extremity takes place, but the pain and discomfort caused by weight bearing is relieved.

Splendid results are obtainable with any of the present-day methods of treating this disability, but the patient should be kept under active treatment for several months following the removal of the plaster spica. During this time the various forms of physiotherapy and massage are employed, and active motion is to be encouraged.

If it is found that the patient is not able to hold the foot in a normal position when standing or walking, an osteotomy of the shaft of the femur near its upper extremity is indicated to overcome the torsion that has taken place during the time that the dislocation has existed.

Milk Injections in Treatment of Pelvic Inflammatory Disease.—Watkins reports four cases of pelvic infection, three being gonorrheal, in which the injection of fat free cow's milk into the gluteal region proved effective. He says that the pain and tenderness are more quickly relieved, and the disease disappears more rapidly under this form of treatment. Less surgery will be necessary, if this treatment is used as a routine, since many patients recover entirely without operation.

CARCINOMA OF THE ESOPHAGUS*

By SIEGEL C. FRANKEL, M. D., Louisville.

The patient before you is Mrs. C. B., white, aged 64, who was admitted to the Louisville City Hospital about two weeks ago. She complained of dysphagia, loss of weight, weakness, considerable heaviness and pressure in the chest after eating, but no pain. These symptoms were relieved by vomiting, which she produced by inserting her finger into the throat.

According to the history, she has been well all her life. She had measles when a child, influenza ten years ago and again six weeks ago. The difficulty in swallowing began two years ago and has gradually become worse, especially during the last two months, and the climax was reached six weeks ago when she developed influenza.

The family history shows nothing of importance. Father and mother died at 84 and 86 respectively of old age. One brother and one sister living. She has a son living and well at the age of 43 years.

Laboratory findings: Urine, specific gravity 1020, albumin one-plus, sugar a trace, an occasional hyaline cast. Blood, hemoglobin 75 per cent, erythrocytes 4,200,000, leucocytes 7,650, with 66 per cent polymorphonuclear cells. The following day another blood count was made which, for some reason, showed considerable change in the picture, viz.: hemoglobin 70 per cent, erythrocytes 3,330,000, leucocytes 10,450. Blood Wassermann re-



*Case report with exhibition of patient and roentgenograms before Jefferson County Medical Society, Mar. 4, 1929

action negative.

The vomitus was examined on several occasions; it consisted of food unchanged of alkaline reaction, practically nothing else.

Physical examination shows practically nothing. The patient is much emaciated, weighing only about 75 pounds. She is so weak that she cannot walk. She complains of being hungry all the time, but food seems to be arrested at a certain point in the esophagus.

Barium given by mouth shows a marked stricture of the esophagus of neoplastic origin located about one inch from the lower terminus. The barium passed the stenosed area in a very fine stream and disappeared toward the pelvis. We could not realize where the barium went. The following day another picture was made which showed marked dilatation of the esophagus above, occlusion of its lumen at the point stated through which the barium trickled slowly, with an elongated stomach located in the pelvis on a level with the iliac crest.

The interesting x-ray features in this case are: The marked dilatation of the esophagus, constriction from a neoplasm and tumefaction below, with an elongated stomach located in the pelvis.

Since admission the patient has been taking liquid nourishment and soft food. She seems to be considerably better than when admitted.

Etiology of Cephalematoma.—To determine whether success alone is sufficient for the production of a cephalematoma, Naujcks subjected an area about 40 mm. in diameter on the scalp of a new-born infant who had just died to mechanical suction. After a few minutes, projection of the scalp at the point of suction was noted. After a half hour the suction cup was removed and the head was cut from the body and frozen. Section of the skull at the point where the suction had been applied revealed that the thickened edematous scalp was raised and that beneath it but separated from the bone by the periosteum, which was firmly adherent, there was a collection of free blood. Convinced that suction alone may produce an epiperiosteal hematoma but not a cephalematoma, the author repeated the experiment with another head. This time he created suction at a point on the right side of the head until a definite projection had developed. Then with a hard, dull object he exerted great pressure and made several rubbing movements on the left side of the head and followed this trauma by the application of the suction cup. A projection of the scalp was produced but it was not as marked as the one on the right side. Examination of the projections revealed a typical epiperiosteal hematoma on the right side and a typical cephalematoma on the left side.

RECURRENT PERFORATED DUODENAL ULCER. CASE REPORT*

By ELMER L. HENDERSON, M. D., F. A. C. S.
Louisville.

D. M. C., a male, aged 27 years, first came under my observation April 4th, 1924, at which time he was complaining of severe pain in the upper right abdomen which had not been relieved by the administration of morphine. There was nothing of importance in the family record or past personal history.

I was called to see this patient about three o'clock in the morning and found him suffering intensely from abdominal pain. He had been seen earlier in the night by another physician, who made the provisional diagnosis of appendicitis and gave him two doses of morphine hypodermatically, but no relief from pain was obtained.

At the time I saw the patient, a few hours after morphine had been administered, he was complaining of most severe pain in the upper abdomen and the abdominal muscles were rigid, the rigidity being more marked over the upper right quadrant. The patient stated that he had suffered two similar attacks of pain, of less severity, during the past month.

The diagnosis of probable perforated duodenal or gastric ulcer was made, and the patient removed to the hospital, where he was operated upon immediately. A perforated duodenal ulcer was found about one inch below the pylorus, and there was a large quantity of stomach contents in the abdominal cavity. The perforated ulcer was closed, the gastric contents removed from the cavity, and the appendix, which was chronically diseased and showed signs of acute inflammation evidently secondary to the perforated duodenal ulcer, was extirpated. On account of the patient's extreme condition, I did not believe he could safely withstand gastro-enterostomy. Although there was some deformity of the duodenum, it was deemed advisable not to attempt the operation. A cigarette drain was placed behind the duodenum and the abdominal incision closed.

The patient reacted well from the operation. Pulse 88, temperature 100° F. Convalescence was uninterrupted by any untoward incident, and he made a splendid recovery, being dismissed from the hospital fourteen days after operation. Sodium bicarbonate was given at frequent intervals during convalescence. I saw the patient two or three times after he left the hospital, and he then passed from my observation.

Laboratory findings on admission to hospital: Blood examination, hemoglobin 85 per

*Read before the Jefferson County Medical Society, May 6th, 1929.

cent, erythrocytes 4,320,000, leucocytes 17,000; differential, polymorphonuclears 83 per cent, lymphocytes 16 per cent, endothelials 1 per cent. Urinalysis: color straw, specific gravity q. n. s., reaction acid, albumin, sugar and acetone negative, phosphates and many crystals present.

I did not see the patient again until January 6th, 1929, at which time he was carried into my office. He was suffering such intense pain in the upper abdomen that he could scarcely talk, he was bent almost double, and muttered that he knew he was dying. After the administration of $\frac{1}{4}$ grain of morphine hypodermatically and allowing him to rest a few minutes, long enough for the morphine to exert its effect, the patient explained that he had gone to the home of a friend for dinner, that in descending the steps he jumped from the third step to the floor at which time he suddenly became faint and ill, that he felt "something break loose" in the region of his stomach attended by severe pain, and that he immediately started to my office in his automobile. He left his car a short distance from the Francis Building and walked into the lobby where he collapsed and was carried to the office by two men. He stated that he had been in very good health since his former operation, excepting that at times he had slight digestive disturbances, until about a week or ten days previously, when he began having pain and soreness in the upper abdomen. For the past week the soreness had been so great that he could scarcely touch his abdomen, and even the slight pressure of his clothing increased the discomfort. He had not consulted a physician, thinking the pain and soreness would soon subside.

Examination at the office showed marked rigidity of the muscles of the entire abdomen. Even after morphine had been administered, a thorough and satisfactory examination was impossible on account of the extreme tenderness which was present over the whole abdomen. Blood count at this time—made in the office—revealed: leucocytes 23,000 with 80 per cent polymorphonuclear cells.

The diagnosis of perforated duodenal or gastric ulcer was made, an ambulance was called, and the patient sent to the Baptist Hospital at once. On arrival at the hospital, another blood count was made, which showed: hemoglobin 85%, erythrocytes (red cells) 5,450,000, leucocytes 29,950; differential, polymorphonuclears 83%, lymphocytes 13%, endothelials 3%, eosinophiles 1%. This demonstrated that the leucocytes were multiplying very rapidly, having increased from 23,000 to 29,950 within three-quarters of an hour. Although the patient exhibited evidences of considerable shock he was prepared and operated

upon as quickly as possible, which was probably within two hours after occurrence of the perforation.

The operation disclosed a perforation of quite a large crater-like duodenal ulcer just below the pylorus. There was considerable scar tissue in this area, which caused some deformity of the duodenum and pylorus. The ulcer was closed, the gastric contents removed from the abdominal cavity, and a posterior gastro-enterostomy then performed.

The patient made an uninterrupted recovery and was walking about the hospital in ten days. A modified Sippy diet was given during convalescence in the hospital. He has been seen several times since leaving the hospital and has remained perfectly well.

COMMENT

I am reporting this case because it is the first one I have seen, where the patient had repeated perforation of a duodenal or gastric ulcer, and for that reason it has been quite interesting to me.

Investigation of the literature shows that it is not so rare as I formerly believed for a patient to have repeated perforations of gastric or duodenal ulcers. For example, Dr. C. K. P. Henry, of Montreal, Canada, has reported a case in which there occurred five consecutive gastric perforations with five operations and recoveries. However, the patient was not operated upon every time by Dr. Henry. Masson and Simon, in 1926, tabulated from the literature 32 cases of multiple gastric perforations, and added one, which came under their personal observation.

In my search of the literature no case record was found in which there had occurred two separate duodenal ulcers, each of which after perforation had been operated upon with recovery of the patient. Doubtless other similar cases have been recorded, but my examination of the literature failed to reveal them. Three instances are mentioned in which there was simultaneous or coincident perforation of gastric and duodenal ulcers, one by Elliott (1908), the second by Scully (1918), the third by Porzelt (1928).

We are quite well aware that in perforated duodenal ulcer, when the condition of the patient will permit, in addition to closing the perforation a posterior gastro-enterostomy should be performed, as there is always more or less deformity of the duodenum or pylorus, which usually causes some obstruction to the onward excursion of the gastric contents. The deformity is due to the formation of scar tissue at the ulcer site, and future ulcer is more apt to occur when gastro-enterostomy is not performed. On the other hand, the fact must be borne in mind that the performance of gastro-enterostomy does not insure the patient against the development of future ulcer, since

it is known that an ulcer in the stomach, in the line of suture, or in the jejunum, may sometimes follow gastro-enterostomy. Dr. Herrmann will show several x-ray films made after the second operation.

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DISCUSSION

Oscar E. Bloch: Dr. Henderson has reported a very interesting and, I think, unusual case. Personally I have never had occasion to operate for a recurrent perforated duodenal ulcer, and congratulate Dr. Henderson on the splendid result obtained. I also want to congratulate him on the beautiful situation of the gastro-enterostomy as shown by the x-ray films exhibited by Dr. Herrmann.

Morris Flexner: There are two questions I would like to ask Dr. Henderson. First, concerning drainage in ruptured duodenal ulcer. As practically all these cases show sterile abdominal contents, and the peritonitis is a chemical one within the first six or eight hours, I am wondering why he drained. In my own experience I have had three such cases, they were all closed without drainage, as I recall it, and did well.

The second point is in regard to appendectomy at the time of the original operation. I would like to have Dr. Henderson say exactly why he did this at the time when the patient's general condition was so critical.

I certainly wish to congratulate him on his results in this most interesting case.

Leon L. Solomon: Like Dr. Flexner, I am wondering whether Dr. Henderson might not well have omitted the doing of an appendectomy in a man so severely and critically ill as this man must have been, after rupture of a duodenal ulcer.

The feature, however, that interests me most in connection with the doctor's report of ulcer and recurrence of ulcer, is the matter of the etiology, responsible for the original denudation and for its recurrence.

About a week ago, I saw a patient from Indiana who, eleven years previous, was operated for gastro-duodenal ulcer. She had remained well for about ten and one-half years, until July, 1928. Suddenly and without warning, there was recurrence of symptoms—pain, faintness, air hunger, followed by the finding of considerable blood in the stool. In July, 1928, in November, 1928 and again in February, 1929, attacks were suffered, suggesting recurrence of the old trouble.

The original etiological factor, explained to me by the referring physician, was infection of a number of teeth in the upper arch, not overlooked by the internist, who saw the case with the surgeon, eleven years ago. Removal of this focus of infection kept the patient free from recurrence for a period of about ten and one-half years. Searching today for the cause, there was discovered infection of several teeth in the lower arch and infection, involving the root of a tooth, which remained in the upper mouth.

Dr. Henderson is to be congratulated on the splendid recovery of his patient from two heroic operations, both of which were done under difficulties, greater in the first instance, where the patient was not seen quite so early as was the case in the second instance.

I am especially struck by a remark made by Dr. Henderson, concerning five separate operations for perforating gastric ulcer, reported by one of his surgeon confreres. I think physicians and surgeons overlook the most important matter in connection with the treatment of this common ailment, when they fail to search for the cause of the ulcer.

In my experience, the onset of symptoms of perforating ulcer has been sudden, at times strikingly sudden. I call to mind just now a man, who had previously presented no gastro-intestinal symptom. He had been warned against a mouth full of infection and had been told that sooner or later, he would likely pay the penalty. Seated at his desk, reading the morning's correspondence, he was suddenly seized with great pain in the abdomen. Coincident had been heard the back firing of an automobile, the patient insisting that he had suffered a gunshot wound. Operated on by Dr. Sherrill, a perforating gastric ulcer was found, the patient making a splendid recovery, as should occur when the surgery is promptly done.

In this instance, because of a generalized pyorrhea, involving both upper and lower arches, radical extraction of all the teeth was immediately done, followed by removal of a pair of badly diseased tonsils. There has been no recurrence in this case during a period of almost twelve years.

Until the cause is removed, our patients are likely to continue to return for recurrence of this all too common malady,—gastric and duodenal ulcer.

A. R. Bizot: Sometimes perforations are so small as to defy detection, even after the abdomen is opened and the tissues examined, unless gastric contents are seen escaping. I believe many of these ulcers will get well without operative treatment, although I am well aware of the surgical teaching that they should be either excised or sutured. Not infrequently the physician makes a diagnosis of appendicitis, when there is really present a perforating ulcer of the stomach or duodenum, and he is justified in his

diagnosis because all the symptoms are referred to the right abdominal quadrant. The patient may be in severe shock and death impending. The abdomen is opened and the appendix is found normal, but the patient is in such extreme condition that further exploration is too dangerous to be undertaken. If a drain is then inserted to a point as high in the cavity as possible, also into the pelvis it is sometimes surprising how quickly the patient will recover and he may have no more trouble. The point I want to make is: if the patient is in collapse and major surgery cannot be completed, introduce a drain and close the abdominal incision. It is sometimes surprising how nicely he will recover.

Dr. Henderson's patient recovered promptly after two operations for perforating duodenal ulcer, and he is to be congratulated on the results.

Simrall Anderson: My experience in acute perforating duodenal ulcer has been limited. I recall having seen only one such case, and that patient came to autopsy. The diagnosis made at the time was acute peritonitis of appendiceal origin. The patient died and autopsy revealed that he had an acute perforating duodenal ulcer. No operation was performed, the patient being practically moribund when first seen.

In Dr. Henderson's second operation upon his patient, I can readily understand how he secured such an excellent result, the fact that he did a posterior gastro-enterostomy provided free gastric drainage, which I am sure is the key to the situation. He is certainly to be congratulated.

George A. Hendon: I would like to suggest that if Dr. Henderson's patient returns with another perforated duodenal ulcer, that he adopt a procedure I have found very valuable; that is, if the ulcer is in the upper portion of the duodenum, after closing the perforation, free the upper part of the duodenum from its attachments, suture the surfaces as I described on a former occasion, then invert the sutured portion of the duodenum with the ulcer and pylorus into the cavity of the stomach. This, of course, has to be done in connection with gastro-enterostomy. In the case in which I employed this procedure the patient made a prompt recovery and has remained well since the operation about three years ago. In that case resection of the pylorus and part of the stomach was out of the question because of the extreme condition of the patient. Another advantage of the procedure is that by inverting the duodenum with the ulcer into the stomach we naturally reduce the liability to future ulcer, because we know that ulcer generally recurs near the former ulcer site. The object is to avoid the tendency to recurrence and increase the margin of safety, which can be accomplished by the procedure I have described. In ulcer of the pylorus less difficulty would be encountered than in duodenal ulcer.

Elmer L. Henderson, (in closing): I thank

the gentlemen for their discussion. As to Dr. Flexner's question about removal of the appendix at the first operation in the case reported. The patient had rather well developed peritonitis and was not seen until ten hours after perforation of the ulcer; the appendix was acutely inflamed, possibly due to the peritonitis that had developed during the ten or twelve hours elapsing between perforation and operation; a considerable amount of the gastric contents had gravitated downward in the region of the appendix, and there were adhesions the result of long standing chronic appendicitis. Only about a minute was required for removal of the appendix, whereas it would have taken much longer to have performed gastro-enterostomy.

In regard to the question of drainage. Sometimes it is not necessary to employ drainage after closure of duodenal ulcer if the patient is seen early, but I have not reached the point where I feel safe unless drainage is instituted in cases where there is any considerable exudate or oozing. I have seen no bad results from drainage, whereas I have seen some disastrous results where drainage was not employed. For example, I have not yet arrived at the point where I think cholecystectomy can be safely performed without afterward inserting a cigarette drain. Only once in my work have I omitted drainage after cholecotomy, and in that case I have reason to believe the result was not as satisfactory as if a cigarette drain had been introduced.

Referring to the remark made by Dr. Bizot about criticizing the diagnosis made by another physician. I did not criticize the diagnosis of appendicitis which was made by the physician who first saw the patient in the case reported. It is often very difficult to differentiate between acute perforation of duodenal ulcer and appendicitis or some other acute intra-abdominal lesion. One of the most reliable differential points I have found in acute appendicitis and acute perforation of perforated duodenal ulcer, is that $\frac{1}{4}$ grain of morphine will relieve the pain in acute appendicitis. I do not recall having seen a case of acute appendicitis without rupture in which $\frac{1}{4}$ grain of morphine failed to relieve pain. However, $\frac{1}{4}$ grain of morphine will not afford relief in perforated gastric or duodenal ulcer, at least that has been my experience.

Dr. Bizot also spoke of patients recovering without closure of the ulcer. I am well aware of the truth of that statement because such cases have been observed in my experience. Two or three years ago I operated upon a man under the diagnosis of acute appendicitis made by another physician. It so happened, however, that I saw the patient and operated upon him for supposed appendicitis twenty-four hours after perforation of a duodenal ulcer had occurred. At operation a low incision was made under the impression that he probably had a ruptured appendix. The patient was in desperate condition

at the time, and after discovering that he had a perforated duodenal ulcer I began extending the incision upward, but the anesthetist informed me that the man could not withstand any further surgery. I then simply inserted a drain and closed the abdomen. The patient had a stormy convalescence and drainage continued for a long time, but he finally recovered and has remained well since.

There is no question, as stated by Dr. Dowden, that patients should be kept under observation for an extended period after having been operated upon for gastric or duodenal ulcer. I believe it is agreed that there is less likelihood of the recurrence of ulcer if gastroenterostomy is performed, and in my judgment this operation is indicated in every case provided the condition of the patient will permit that much surgery. In the case reported, however, at the first operation the condition of the patient was so extreme that I believe if gastro-enterostomy had been attempted he would not have survived. If this patient had remained under the observation and treatment of a competent medical man after the first operation, it is quite possible he would not have had the second ulcer. Even after the development of symptoms indicating the second ulcer, he did not consult a physician until perforation occurred, when he returned to me. He was then in extremis and there was no time for proper preparation prior to operation.

I fully recognize the importance of Dr. Sclomon's remarks about searching for the causative factor and making an early diagnosis if possible. In the majority of instances the patient is not seen until perforation of the ulcer has occurred. Not a single patient coming under my observation for perforated gastric or duodenal ulcer had been previously treated for ulcer. All of them have been neglected cases, that is the patients had not been under medical treatment for gastric or duodenal ulcer.

I have had no experience with the method of management described by Dr. Hendon, but enjoyed very much his report on the subject made two months ago.

Transmission of Respiratory Anaphylaxis from Mother to Offspring.—Ratner and Gruehl succeeded in inducing respiratory anaphylaxis in a pregnant guinea-pig by the inhalation of a dry antigenic dust, and the anaphylaxis was transmitted from mother to offspring. A guinea-pig thus sensitized in utero, when brought into contact for the first time with an anaphylactogenic dust to which the mother was sensitized, will manifest respiratory anaphylaxis. This state of hypersensitiveness may be transmitted in varying degrees of intensity, and when two or more offspring are born in the same litter, they may in some instances be sensitized to an equal degree and sometimes to different degrees. This state of hypersensitiveness can be transmitted through more than one litter.

AN OPERATION FOR PERFORATED DUODENAL ULCER*

By GEORGE A. HENDON, M. D., F. A. C. S.
Louisville.

I am well aware that there are numerous true and tried procedures that are successful in the management of the condition which serves for the title of this paper. However, it is strictly in the line of progress to seek for improved technique, and the improvements which are most worth while are those which afford simplicity, safety and rapidity. An operation for the relief of a perforated ulcer should be one that involves as simple a technique as possible to avoid extensive handling and time consuming manipulations of viscera. The reasons for these requirements are quite obvious, but there may be another reason that does not stand out so easy to perceive, and that is that many times, under the stress of circumstances, these operations must be done by persons not possessing the very highest degree of surgical skill. They are emergency measures and emergencies are prone to fall under the care of the occasional surgeon and as our highest aim in the profession should be to provide protection for as many victims as possible, a simple procedure fulfills a very important demand in practice. That is one reason, one apology, for my presenting and describing the operation which I shall illustrate.

This operation has proven in one case to be as efficient and as competent as any that I have seen published in the literature. The element of safety in this operation is greatly enhanced by the rapidity with which it can be performed. The competency is supported by the fact that the patient upon whom I operated had been for 10 or 12 years an ulcer sufferer, but since the operation she has had no symptoms referable to the stomach or duodenum.

There could be nothing achieved in this discussion by presenting as parallel illustrations the standard and accepted methods which are well known and well understood by every surgeon in the audience. No progress can ever be achieved by repeating the mistakes of our ancestors or by emulating infirmities of our contemporaries. It is my sincere hope that the discussion, if any, will serve to emphasize the points that recommend this procedure. It is especially desired that it will make conspicuous the deficiencies or the source of possible incompetency in the proposed measure. We know about resections, excisions, gastro-enterostomy, plications, all of these have their merit.

The operation which I propose may be like many other things that in my limited field of

*Read before the Jefferson County Medical Society, March 18th, 1929.

vision, I thought were true but untried, which upon extended investigation proved to be ancient and discarded. If such proves to be the case in this instance I trust I have offended no one but myself.

The patient was Mrs. K., aged about 36, who for many years suffered with the classical symptoms of visceral ulcer. She had gone through the usual routine of therapeutic ritual and with the usual results, no better and no worse. About 8 hours before I saw her she had been suddenly seized with epigastric pains of the most excruciating character which caused sudden collapse and unconsciousness. She was brought to the St. Anthony's Hospital by Dr. Malcolm Beck, who had made the diagnosis of perforated ulcer; all the typical signs of profound shock were present, rapid pulse, cold surface, subnormal temperature. The abdomen was immediately opened, stomach and duodenal region exposed, a perforation the size of my little finger was readily perceived in the duodenum distal to the pyloric valve. The abdomen was full of intestinal fluid and a stream as large as a lead pencil was seen to issue from the duodenum. An effort was made to close this opening by through-and-through stitches which would include the entire wall of the intestine, but there was such extensive cartilaginous substance surrounding the opening that the stitches could not be made to hold; at every effort to tighten them they cut through the margins of the ulcer. This degenerated tissue extended over such a wide area that if I had been able to hold the margins in contact, the lumen of the intestine would have been destroyed and not sufficient peritoneum remaining to make a secure closure. The only other procedure that seemed feasible or even possible was a resection of the pyloric end of the stomach and the upper portion of the duodenum. This I was convinced the patient would not endure, so I closed the opening by placing my sutures well back of the ulcerated area and using interrupted sutures; when they were tied the upper portion of the duodenum almost down to the entrance of the common duct was completely closed by approximation of the mucous surfaces; I then freed the upper portion of the duodenum from its attachments and pushed this entire portion, by a process of invagination, into the cavity of the stomach, retaining this invagination by interrupted sutures placed at regular intervals.

The next step was a posterior gastro-enterostomy which provided for drainage of the stomach. The appendix, which had fortunately not been sacrificed, was then brought out at the lower angle of the incision, the meso-appendix ligated and divided, and the tip excised. A number 16 catheter was introduced

through the lumen of the appendix into the colon and anchored by 2 or 3 linen sutures. The catheter and engaged appendix were brought outside the abdomen and the incision closed. For 6 days thereafter the patient received all fluids and nutrition through the catheter. The intestinal contents and gases escaped into a bottle by the same route. At the end of 6 days the appendix had sloughed off and the catheter was removed. As a result of this measure we did not have to impose any burden whatever on the damaged stomach and duodenum during that time, in consequence of which rapid and perfect healing was established. The cecum adheres to the abdominal wall and the fistula through the stump of the appendix very promptly closes.

I have employed this procedure with the appendix 17 times with 16 recoveries and no fistulae at all.

In doing the invagination operation involving the duodenum and stomach, a large factor of safety is acquired because of the fact that two layers of serous membrane, two layers of muscular coat and two mucous serve to surround and overlap the perforation. This I consider to be of immense value in securing complete protection.

This patient made a rather smooth convalescence and now after a period of almost two years, she is well and as she expressed herself, "doesn't know she has got a stomach."

An Ewald test meal extracted and examined for me by Dr. Applehaus on March, 10, 1929, gives the following report:

Time eaten, 7:50: Time withdrawn, 8:45: Amount 92 cc: Appearance, chiefly mucoid: Color, greenish: Odor, malty: Free HCL and combined HCL both absent: Total acidity, 10: Lactic acid, negative: Bile negative.

The first picture, a drawing which was made for me by Dr. McCrocklin, shows the general plan of the operation; the invaginating stomach and duodenum can be readily seen in the insert; posterior gastric-enterostomy is shown in the larger view. The next picture gives a very good idea of the position of the catheter going through the appendix into the cecum. The third picture is a roentgenogram showing the actual situation of the catheter. The fourth is a roentgenogram of the stomach taken about two hours after the operation. The fifth is a more or less diagrammatic presentation of the operation, the purpose of which is to give a clearer outline of the various steps employed.

DISCUSSION

John R. Wathen: The interesting case reported by Dr. Hendon should not be permitted to pass without discussion. There is no more serious condition encountered in abdominal surgery than perforated duodenal ulcer. Despite the fact that every possible means may be uti-

lized to save the patient's life. the mortality is certain to be high. As Dr. Hendon has said, the duodenal tissue surrounding the perforation is often very friable and closure of the opening by sutures is impossible. The same is true of scar tissue and fibrous tissue. If the perforation could be successfully closed the duodenal lumen would be practically obliterated.

I think Dr. Hendon has suggested something original. I do not recall having seen the method he employed described in literature. He spoke of the feasibility of resecting the pyloric end of the stomach and the involved portion of the duodenum. Such an operation is attended with considerable danger and there is always the possibility of the duodenal closure being insecure. Even when the duodenum is comparatively healthy some difficulty may be encountered in satisfactory closure.

I would like to ask Dr. Hendon what will become of the duodenum and pylorus which he inverted into the stomach? Will the invaginated tissues slough off? I would suggest that a roentgenogram be made to ascertain whether sloughing has occurred or not. We know that nearly everything introduced into the stomach is digested, and in that event trouble is likely to follow.

So far as I know the operation performed by Dr. Hendon is unique, and considering the serious problem which confronted him, I believe he acted wisely in resorting to the procedure described.

Hydrogen Ion Concentration of Cerebrospinal Fluid in Eclampsia.—Schpoljansky and Danzig noted that the hydrogen ion concentration of the cerebrospinal fluid shows marked variations in eclampsia: from a high degree of acidosis to a high degree of alkalosis (from 6.36 to 8.9). Neither the acidosis nor the alkalosis of the cerebrospinal fluid is dependent on the severity of the condition, the number of the attacks or the functional disturbance of the kidneys. Before labor alkalosis is more frequently noted, whereas after labor acidosis is more common. In the second half of pregnancy an acidosis of the blood frequently develops, accompanied by a diminution in the alkali reserve. The higher the alkalosis of the cerebrospinal fluid is, the lower is the alkali reserve of the blood. The alkali reserve of the blood binds first the acidosis of the brain; this may possibly explain a displacement of the cerebrospinal fluid to alkalosis.

LOW BACK PAIN*

By WILLIAM BARNETT OWEN, M. D., F. A. C. S.
Louisville.

As an appropriate introduction to the subject of low back pain, I desire to quote two paragraphs from an article recently published by Allison: "The physical complaint known as backache is so common, so variable, and so inclusive in its nature, in its causes, and in its effects, that it is difficult to assemble the facts, to arrange these facts in any kind of order, and to make any useful deductions from what seems to be, for the present at least, a hopeless mass of unclassifiable clinical observations.

"Among others, the orthopedic surgeon is thought to be the person who should be able to help the patient with backache. The orthopedic surgeon is credited with possessing not only the requisite knowledge for accurate diagnosis, but also with having at his disposal methods of therapy that bring about rapid and complete recovery. In the attempt to fulfill this obligation many discouraging and difficult obstacles are met."—(Allison).

At the outset it must be understood that we recognize backache as a symptom not a disease, and it represents one of the most frequent manifestations for which patients seek medical or surgical relief. The lower lumbar region, the sacrum and the hips, suffer most often in all types of back discomfort.

The larger percentage of backache are trivial and temporary. In this group little or no treatment is required beyond possibly a short period of complete rest. Were this not true, there would be less frequent employment of porous plasters, nostrum vending, "kidney pills," the practice of charlatanism, manipulative quackery, etc., for which there are widespread claims of success.

In the second group the situation is more serious, and careful clinical study, together with roentgen-ray and other laboratory investigations are necessary to determine the causative factor.

The third and most important group consists of backache due to definite pathological lesions involving the bones and articulations of the spine and pelvis, or possibly the result of various affections having their origin in other parts of the body than the spine and pelvis, such as the kidney, the prostate, impinging tumors of adjacent viscera, pelvic disease in the female, etc.

Allison has classified the causes of backache as follows: (1) trauma, (2) bad attitude, (3) congenital anomalies, (4) arthritis, (5) malignant disease. In brief, he says, the

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lesions that result from these causes are: (1) fracture, (2) sprain, (3) strain, (4) bad mechanics, (5) deformity, (6) destruction of bone and joint tissue with abscess formation and resulting ankylosis.

The determination of the specific causative factor of low back pain is not always easy of accomplishment, and in some instances it may be impossible. There may be present only subjective symptoms. In some cases where there is a history of injury, sudden onset and continued pain, both the roentgen-ray and the clinical findings may be negative. The disability from pain persists, particularly in compensation cases, and the only satisfactory treatment is a "greenback poultice" or a "gold inlay." We have all seen a limited number of these cases respond immediately when the above-mentioned treatment was given, after everything else had failed.

Roentgen-ray study of the lumbosacral and sacroiliac joints is frequently unsatisfactory because of the great structural variation even in symptomless backs, and the sacroiliac joint is difficult of approach. We are, therefore, forced in many instances to rely upon the history and the clinical findings in the formulation of our conclusions.

Goldthwaite states that the more these cases are studied the more obvious it becomes that most of them are due to mechanical causes, they are not primarily inflammatory and are therefore generally relieved by mechanical measures.

In Cochrane's study industrial back injuries are considered from the following six angles:

(1) The anatomical type of the subject. The slender, hypermobile spines with small vertebrae and flat articular facets cannot withstand the stress of heavy work. They frequently have a high fifth lumbar vertebra or sixth lumbar vertebra.

(2) Back pain arising during light or heavy work in persons who use the body in positions of mechanical disadvantage. In these the important factor is often the chronic lumbosacral or sacroiliac strain of poor posture. In acute traumatic sacroiliac strain any displacement is in the nature of a rotation which, if it is revealed in the roentgenogram at all, appears as an asymmetry at the pubis.

(3) Persistent pain in the lumbosacral region when the roentgenogram reveals no evidence of a gross lesion. Most of these cases are due to persisting intrinsic lesions, i. e., muscular or aponeurotic strains.

(4) Disproportionate pain induced by trauma to a spine with a pre-existing symptomless arthritis.

(5) Anatomical variations in the lumbosacral region in relation to accident and injury to the back. An asymmetrical arrange-

ment is essentially a poor mechanical arrangement and likely to "give out" under the strain of heavy work. The commonly existing bursa between an enlarged fifth lumbar transverse process and the top of the sacrum and a semi-sacralized fifth lumbar vertebra are very subject to strain. In complete closure of the spinal arches, or spina bifida occulta, in the presence of poor body mechanism, excessive lumbar lordosis, and forward tilting of the pelvis, deprive the spine of the support of the impingement of the spinous processes between the fifth and first sacral vertebrae, thus throwing increased strain on the "locked-home" sacroiliac joints.

(6) The mental problem.

Cases of back strain are divided into five groups: (1) acute traumatic strain, 60 per cent; (2) general postural strain, 10 per cent; (3) lumbosacral strain, 12 per cent; (4) sacroiliac strain, 8 per cent; (5) combined pelvic joint strain, 2 per cent.

The conclusion is drawn that injury of the back is often only one factor in the problem, and that injury and strain are apt to be the last link in a chain of physical unsuitability, poor body mechanics, and possibly anatomical variations, long-standing disease, or fracture of the spine.

In the routine examination of an individual with back strain the importance of an exact history is emphasized. The patient should be questioned regarding the mode of onset and the immediate and late symptoms. The chief determinations to be made from the examination are:

(1) The body type and the general statics and body posture. Poor general body mechanics and posture have an important etiologic and prognostic significance. The posture in sacroiliac strain is characteristic.

(2) The lumbar curve. This is usually exaggerated in static abnormalities in which there has been no trauma, and is flattened in cases of intrinsic lesions, sciatic scoliosis, and muscular spasm due to injuries to the muscles or aponeuroses.

(3) Lateral deviations of the column. These may be merely attitudinal, as from inequality in length of the legs; temporary and positional, as from muscle spasm; or definite and fixed, as from structural abnormalities or disease. Examination for rotation of the spine should also be made.

(4) Situation and distribution of pain and tenderness and the presence or absence of muscle spasm.

(5) Movements of the spine. Spinal movements should be tested with the patient standing, sitting, and dorsal lateral and ventral recumbency. Hypermobility occurs in cases of general postural strain in persons of the slender type of anatomical structure.

Rigid immobility in every direction points to an intrinsic lesion of the spine. Asymmetrical immobility may be due to an intrinsic or an extrinsic lesion. In lumbosacral lesions, flexion takes place in the hip joints and dorsolumbar regions, while in sacroiliac lesions the patient first flexes the lumbar spine, continues the movement by tilting the pelvis until the ham-strings become taut, and then flexes the knees. In lumbosacral lesions flexion is as limited in the sitting as in the standing position. Patients with sacroiliac lesions can bend forward easily as no leverage is transmitted to the pelvis.

(6) Other determinations. Muscle atrophy should be noted, the reflexes and sensations tested, and roentgenograms made. (Cochrane).

Many of us have encountered individuals with protracted disability from low back pain caused by chronic arthritis. A large percentage of these patients have been permanently relieved by autoplasmic fixation of the lumbosacral and sacroiliac joint. We recently saw a case in which the lumbosacral and sacroiliac were fused at one operation for disabling chronic arthritis in these joints. The operation was performed eighteen months ago, and the patient has remained well since.

We have operated upon eleven patients for obstinate and disabling sacroiliac strain, with a clear history and clinical picture, but negative roentgen-ray findings. In these cases every palliative and mechanical means known had been employed with failure. Eight of the patients are cured; two operated upon during the last six months are improved; one was not benefited.

The same operative principles are employed in fusion of the lumbosacral and sacroiliac articulations as in arthrodesis of other joints, with the exception of the supplementary osteoperiosteal graft which insures more complete ankylosis.

Compression fracture of the spine can occur more easily than ordinarily supposed. Two cases recently observed are briefly mentioned to illustrate that fact:

(1) A nurse, while scuffling with another nurse in one of our nurses homes, lost her balance and fell to the floor, a distance of a few feet, landing in a sitting position. She immediately complained of rather severe pain in the lower back. A lateral roentgenogram of the spine disclosed a compression fracture of the first lumbar vertebral body. There were no cord symptoms.

(2) A young woman was riding in the rear seat of an automobile which ran over a block of wood about four inches thick, throwing her off the seat her head striking the automobile top, which caused her to sit down on the seat suddenly. A lateral roentgenogram of the spine revealed a fracture of the

twelfth dorsal vertebra. No cord symptoms developed.

Allison presents the following excellent summary of the causes of backache based on experience at the Massachusetts General Hospital:

(1) General debility, mental and physical fatigue.

(2) Gynecological and genitourinary lesions.

(3) Neurological lesions, spinal cord tumor,—often overlooked.

(4) Static and postural causes; body types.

(5) Partial or complete spondylolisthesis resulting from bad position and heavy strain or injury.

(6) Metabolic, toxic or infectious affection of the muscles,—lumbago or myositis.

(7) Acute trauma: strain, sprains, aponeurotic or muscle tears.

(8) Fractures: transverse and spinous processes and compression fractures, often overlooked; also dislocations.

(9) Arthritis, the ankylosing type and the non-ankylosing type.

(10) Impinging spinous or transverse processes.

(11) Congenital variations, especially asymmetrical or sacralized fifth lumbar vertebra.

(12) Spina bifida occulta.

(13) Tuberculosis, syphilis, typhoid fever, osteomyelitis.

(14) Neoplasms: sarcoma, carcinoma, and non-malignant giant-cell tumor; multiple myeloma.

(15) Combinations of any of the foregoing.

Time will not permit extended consideration of the various measures which may be used in the attempt to relieve low back pain. Many methods have been recommended some of which are still in vogue, and volumes have been written on the subject. Remembering that backache is only a symptom, the cause must be determined before the proper remedial measure can be selected and applied. The causative factors are so numerous and diversified, that to devise a universally applicable and satisfactory plan of management would be impossible.

In closing, I wish to emphasize the statement that in attempting to relieve low back pain, all the known conservative measures which seem to offer any promise of benefit should be given a thorough trial before resorting to operative procedures.

For many of the data presented in the foregoing paper I am indebted to the excellent articles by Allison, Goldthwaite and Cochrane, listed in the references, and wish to thank both the authors and publishers for

the privilege exercised in abstracting and reproducing the material.

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DISCUSSION

Orville R. Miller: I certainly appreciate the invitation to be present at this meeting, and have thoroughly enjoyed Dr. Owen's paper and the lantern slides he exhibited. When subjects of this type are being discussed, I am reminded of a short poem I saw at one time which reads something like this:

I wish I was a little rock a settin' on a hill
 Doing nothin' all day long but just a settin' still
 I wouldn't eat, I wouldn't drink, I wouldn't even wash,
 I'd set and set a thousand years and rest myself
 by-gosh!

I feel that I could sit a long time listening to discussions of this sort because they are so extremely interesting.

The subject of low back pain is one of such magnitude that much might be said about it. We know that all the lesions mentioned by Dr. Owen are causative factors in the production of low back pain, and when a patient presents himself for diagnosis and treatment of such conditions, we realize that we may have a "long road to travel" sometimes and a great many things to exclude in arriving at a correct diagnosis and of course treatment depends primarily on an accurate diagnosis.

One feature I particularly wish to mention in connection with fracture of the spine is the probability of the development of Kummell's disease. I have seen a few of this type in cases of compression fracture of the vertebra in which the patient later discontinued treatment, or in which there was much displacement of the body of the vertebra, after only a short period of fixation. Afterward, however, in the most of these cases there was apparently a very good result, inasmuch as the patient was able to go about following the required period of fixation. I believe many of these patients treated in rural sections, and some of the cases seen within the limits of our own city, have not been diagnosed in the beginning, and because of that have failed to receive the proper amount of fixation, that is fixation over a sufficiently long period of time, and consequently develop Kummell's disease, which is really a rarefying osteitis of the vertebra and which requires fixation just as in other cases of fracture of the spine in which there is considerable pain. Kummell's disease may not become manifest for a considerable period of time, occasionally a year or even more, following the original injury.

Quite frequently I have found that patients

suffering from low back pain had colitis or rectal involvement. This was covered by the essayist in his reference to infection which produced arthritis, though some of these patients show no signs of arthritis so far as lipping or contraction around the joint is concerned. On the other hand, some of them present a picture perfectly typical of lumbosacral arthritis, and sometimes with pain over the sacro-iliac joint. I think the treatment of either of these lesions is fixation such as Dr. Owen has mentioned, either by means of a bone graft on the spine or in the Hibbs operation. If the lumbosacral joint is affected, with involvement of the sacro-iliac articulation, then a combination of the Hills-Aibee, the Smith-Peterson, or a massive bone graft bridging across the sacro-iliac and lumbosacral joints may be used. These are difficult cases to handle because they are chronic in nature and the patient often believes his condition is hopeless and becomes more or less neurotic.

John W. Price: I have certainly enjoyed Dr. Owen's paper. It has not been my fortune to see many of the serious lesions portrayed in the pictures the essayist has exhibited, but I have seen a number of minor lesions in patients who injured themselves while lifting heavy weights in a squatting position, and complained of pain over the sacro-iliac or over the lower lumbar area. When over the lower lumbar region I have always believed, as a result of muscular effort, there was probably a pulling loose of some of the muscle fibers, fascia or ligaments, and there was not much that could be done by any external application, and yet with rest and massage the majority of the patients I have seen have returned to work. Where there was merely a strain of the sacro-iliac joint temporary strapping has helped most of the patients. I realize that in the more serious types of injury strapping would not be helpful, but the majority of the patients seem to recover after a few weeks. If a man gives a history of lifting a heavy weight while in a squatting position and then has sudden pain over the sacro-iliac region, we can safely make the diagnosis of sacro-iliac strain, and after a reasonable length of time nearly all these patients are able to return to work.

We sometimes see patients who complain of pain in the abdominal muscles which extends downward into the inguinal regions. In these cases a cure is just as difficult as in the other types described by Dr. Owen and Dr. Miller. In some of the compensation cases the patients are never cured until they have a "greenback plaster" applied.

In February or March, 1917, a mechanic was working under an automobile suspended by ropes and pulleys. Something happened to the pulleys, while he was sitting on the floor working on the rear axle of the car, which allowed the machine to descend striking him in the up-

per dorsal region and he was "jack-knifed" by being bent forward. I arrived about fifteen minutes after the accident, and realizing that something must be done promptly, he was taken to the Norton Infirmary where a roentgenogram was made which showed a fracture of one of the lower dorsal vertebrae. The displacement was not very great, and yet this man developed sensory and also motor disturbances. A plaster cast was applied with the patient in full hyperextension and he was placed in bed. In talking with one of my colleagues about the case two or three days later, he told me it would be a piece of luck if a favorable result was secured because ordinarily vertebral fracture, especially where there was some involvement of the spinal cord, required immediate operative procedure to remove the fragments, just as acute appendicitis requires immediate operation. This man seemed to be doing well, after a few days the symptoms improved, and he had a little more motor impulse. At the end of the three months both sensory and motor reaction seemed to be perfectly normal. The plaster cast was removed. In September of the same year he was driving a truck hauling lumber to Camp Taylor. That case was very interesting in that the man made a complete recovery. Probably it might have been better to have operated immediately for removal of the damaged bone, but the roentgenogram did not show very much displacement, and I thought it might be that hemorrhage accounted for the symptoms. Had we operated the man might not have made the good recovery that he did.

Guy P. Grigsby: Dr. Owens has presented a very interesting paper. I know of nothing that will cause more trouble and anxiety to the patient and worry for the physician than back pain. It is sometimes very difficult to find the source of the trouble. One important feature mentioned by Dr. Owen is that even comparatively slight back injuries should be regarded as serious until proven otherwise.

In this connection, I would like to briefly re-cite one case. A man was working on a telephone pole and fell ten or fifteen feet. He was apparently rather seriously injured and was placed in bed. In the course of a few days he had improved sufficiently to be out of bed, but his symptoms persisted. I was asked to see him two or three weeks after the injury. He was working in Eastern Kentucky at the time of the accident. He rode to Louisville in an automobile, and roentgen-ray examination the next day after his arrival showed a fracture of the twelfth dorsal vertebra. He had no spinal cord symptoms whatever. The nature of the injury was overlooked by two of three local physicians who saw him shortly after the accident. No roentgen-ray examination was made at the time. That is an important point and was emphasized in Dr. Owen's paper, i. e., to regard injuries followed by back pains serious and not dismiss these

patients as neurotics who are complaining without cause. Roentgen-ray examination will sometimes reveal serious injuries.

J. Rowan Morrison: I would like to ask Dr. Owen and Dr. Price whether they have seen patients giving a history of injury to the lower part of the back who complained of pain only in the abdomen? I ask that question because a few days ago I saw a man who complained of abdominal symptoms. He had gastroparesis. He apparently had no particular lesion, but the roentgenogram showed considerable lipping about the lower spine. The abdominal pain in this case was probably due to arthritis rather than any gastro-intestinal lesion.

I was glad to hear Dr. Owen say what he did about operations for the relief of back pain. It has been my observation that many of these patients are benefited by surgical procedures.

Wm. E. Gardner: Dr. Owen's paper is very interesting especially from the standpoint of again calling our attention to the fact that there is such an entity as sacro-iliac strain. I think there has been a tendency during the last few years to disregard such a possibility on account of the fact that there have been so many cases of purely functional disturbances following slight injuries in which the individual suffered a great deal of pain, and the fact that in many of these cases the question of compensation entered as a possible factor in production of the symptoms, the individual was considered to be suffering from litigation neurosis with no organic lesion nor even a traumatic neurosis. I think it is very important to have a thorough roentgen-ray study made of every patient who complains of pain in the back following injury. These investigations should be made by a man who has studied a large series of this class of cases, who has made many roentgenograms of the spine both antero-posteriorly and laterally, and not in a casual sort of way by a physician who has not seen many of those conditions like sacro-iliac strain, otherwise the lesion may be overlooked, even in the cases which might be considered purely functional following injury if the patient has pain in the back. These individuals are not always malingerers, they are not always suffering from litigation neurosis. Sometimes pain is very severe at the time of the injury with a certain amount of shock, and the attention of the patient has been so thoroughly fixed on the injury that it is practically impossible for him to dissociate his pain from the injury, even where there is no question of compensation, yet he continues to have pain until finally the diagnosis of true traumatic neurosis is made without any definite organic lesion, and he continues having symptoms indefinitely which are very difficult to relieve. I occasionally have patients who have had such injuries referred to me for study after thorough roentgen-ray investigation has been made by experts and all possibility of an

organic lesion seems to be excluded, yet these patients still have pain and it is difficult sometimes to say whether there is a real basis for the pain or whether it is purely a neurosis.

Dr. Owen's paper has been most instructive and I would like for him to tell us whether in all of those patients with sacro-iliac strain operated upon for relief of clinical symptoms without roentgen-ray findings, there was a rather definite history of severe injury followed by pain, or whether in some of them there was no recollection of injury? In other words, might there have been slight injury at some time that the patient did not recognize and that later produced symptoms of sacro-iliac strain or other manifestations referable to the back?

Philip F. Barbour: I have enjoyed Dr. Owen's paper and exhibition slides very much and particularly the instructive and helpful talk. A severe strain of the ligaments of the sacro-iliac joint and possibly rupture of the same are rather frequent and are often not properly diagnosed. It requires an expert like Dr. Owen to interpret the x-ray plates in such cases. The pain is very severe and extends down into the thigh and may require strapping or even a plaster cast before a cure is effected. Anyone who takes much exercise especially lifting heavy weights may produce an injury to this joint.

I believe bad posture is often responsible for pain low in the back. Many children who have a protuberant belly with round shoulders and sway back complain all the time of feeling tired. Children of this age do not definitely locate pain and possibly do not tell us just where the pain is. I believe this posture which is quite common in childhood often incapacitates a child for work or play. Such cases need to be thoroughly instructed in good posture if they are to escape a long delay in proper development.

Morris Flexner: Dr. Owen's paper has been very interesting and instructive to me. I think we are greatly indebted to him for giving us such valuable information. One important result of the investigation and study of this subject has been to relegate what was formerly diagnosed as sciatica to the scrap heap. Before we knew much about the sacro-iliac joint sciatica was regarded as a separate clinical entity. However, since we now regard sciatica as merely a symptom of sacro-iliac disturbance and direct treatment to the sacro-iliac joint, sciatica has become a much simpler problem.

One other clinical point which I believe was not mentioned by Dr. Owen is the special area of tenderness in sacro-iliac disease, described by Dr. Wm. Baer. There are two distinct points of abnormal tenderness, right and left, on deep pressure in people who have sacro-iliac disease.

From a diagnostic standpoint, backache is extremely interesting. My attitude on the subject is very much like that stated by Dr. Morrison. When these patients come to us we always

make a thorough investigation, as there are many things to be considered before directing them to the orthopedist. Intestinal infection, as stated by Dr. Miller, is frequently responsible for low back pain. I have seen two patients recently with colitis who had typical low back pain. Occasionally renal colic has to be excluded.

As a class these cases are very interesting, because they lead us frequently through the entire diagnostic gamut and must be carefully studied from the standpoint of many of the bodily systems before we can definitely determine whether the lesion is in the bone or joint.

Granville S. Hanes: Dr. Owen has given us a most excellent discussion on the subject of backache. It is one that interests no meager number of doctors. I am especially interested in the subject for the reason that a large number of patients who consult us have this symptom in a more or less severe form.

In addition to the various causes of backache as given by Dr. Owen I feel very sure that a great many patients affected with backache have this symptom as a consequence of disease in the sigmoid and rectum. I make this statement for the reason that I have seen numerous patients completely relieved of severe backaches when the pathology in the colon and rectum had been treated. I am going to refer briefly to one or two patients to verify my contention that the soft structures in the pelvis are frequent sources of backache.

A lady recently consulted me complaining of backache of long duration. She brought with her an apparatus which she had worn for years to support her back but it continued to ache. She gave a history of a very bad digestion and the elimination of large quantities of mucus from the bowel. When examined in the inverted posture with a proctoscope the mucosa was easily seen to be red and granular. The lumen of the sigmoid was so narrow, from the extreme spasticity, it was impossible to introduce a small proctoscope well into the sigmoid. Even though the end of the instrument had scarcely passed into the lower sigmoidal segment it caused excruciating pain when tilted to one or other side as the result of traction on the diseased tissues. In her treatment she took every possible care to eat the food that agreed with her best. She took hot injections of solutions of argyrol, ichthyol, mercurchrome, iodine, etc., and retained three or four ounces of water over night with some one of the above agents added. While taking these treatments we continued every second day to try to introduce the proctoscope further into the sigmoid when finally we succeeded. Graduated larger instruments were then used until the largest size could be introduced. When the sigmoidoscope was introduced full length the distal end was gently and slowly moved to either side as far as the patient would allow, on account of

pain. This procedure, we have found, aids greatly in relieving the spastic condition and the sensitiveness of the parts.

It was a great aid, as in all similar cases, to pour into the sigmoidoscope one or two drams of $\frac{1}{2}\%$ novocain when trying to introduce the proctoscope well into the sigmoid. After the novocain was poured in the obturator was introduced and a well trained nurse manipulated the instrument, moving the distal end gently from side to side, increasing the excursions as much as the patient would tolerate. This is a tedious and dangerous procedure. In many cases it takes months to get well into the sigmoid. In a few instances, on account of adhesions, the instrument can not be introduced full length into the sigmoid.

When the first examination is made with the proctoscope a boric acid, silver or some solution of mild strength is poured into the bowel for retention. We use about three ounces of the fluid and the patient remains inverted five or ten minutes to aid in retaining the medicament.

To relieve these patients is a long and tedious task both on the part of the patient and the doctor. The infections in the colon, sigmoid and rectum are usually chronic and the bacteria act slowly, insidiously and constantly. When they become well implanted in the tissue terminal bowel it is a Herculean task to rout them from their habitat. Patients so affected usually go from doctor to doctor with little relief. They are not properly informed by us. They therefore, from sheer desperation continue for years to hunt for relief.

When there is a deep-seated involvement of the rectal and anal structures causing a contracted, spastic state of the lower bowel pains are reflected in the back, hips, bladder, vagina, legs and all parts of the pelvis. The only hope of complete relief or an approach to such a state is to deal with the cause.

In addition, then, to the various types of backache due to bones, their joints, ligaments, etc., which Dr. Owen has so clearly and attractively presented to us tonight, I feel we should also keep in mind the large number of backaches that are due to various diseased conditions of the terminal bowel and other soft structure in the pelvis.

Wm. Barnett Owen, (in closing): I thank the members for their liberal discussion. The subject of backache is more or less interesting to to every physician, because no matter in what special line of practice he may be engaged, he will have an opportunity to see many patients complaining of this particular symptom.

I thoroughly agree with those who have stated that the lower intestinal tract is responsible for a high percentage of cases of arthritis. Cases in which arthritis is present in the lower spine are numerous, and I mentioned some of the operative procedures designed for its relief. I do not

want to create the impression that we advise operative measures in all cases. It is only after a thorough investigation, competent medical counsel, the removal of all possible foci of infection, the thorough trial of all palliative and mechanical means, and if these fail we then resort to operative procedure. In some cases after everything else has failed the spinal fusion operation has been productive of good results.

I disagree with those who disclaim the existence of sacro-iliac pain on the ground that the joint is immovable. There is a certain amount of motion in the normal sacro-iliac joint otherwise there would be no joint. Injury to this joint or a severe strain is invariably accompanied by intense pain. In such cases the onset of pain is immediately following the injury. It is true, however, that a patient may sustain a slight injury to which little attention is given at the time, and later develop traumatic arthritis, which gradually becomes worse.

Dr. Morrison asked about abdominal pain following arthritis of the spine or injury of the back. I have seen that occasionally but never regarded it as a very valuable clinical symptom. Pain at the site of injury or strain is a very valuable sign when the onset is sudden.

In sacro-iliac strain the roentgenogram is practically always negative. Both antero-posterior and lateral pictures of the spine are made in all cases to exclude any possibility of bone pathology. We then proceed with routine clinical tests. The most valuable is the postural test which produces pain in most cases. The leg cannot be raised six inches without producing severe pain. In rare instances it is possible to raise the leg half the normal distance without the patient complaining of intense pain. This is an indication that the injury or strain is not severe.

Application of Reid Hunt Reaction to Diagnosis of Pregnancy.

Eufinger et al. found that the acetonitrile resistance of white mice is definitely increased by treatment of the mice with serum from pregnant woman. The gradual increase in this positive Reid Hunt reaction becomes more marked as the pregnancy progresses, reaches its highest value during labor, and rapidly returns to normal during the puerperium. Of the patients with toxemia who were examined, those with hyperemesis did not show a deviation from the normal whereas those with eclampsia usually showed abnormally high value. In parallel examinations of the blood of mother and child, a marked difference between the two kinds of blood was noted. The blood of the umbilical cord as a rule showed normal or slightly increased values. The results lead the authors to believe that hyperfunction of the thyroid is present during pregnancy.

PRE-CANCEROUS DERMATOSES*

By ROBERT L. KELLY, M. D., Louisville.

A pre-cancerous dermatoses is one that will ultimately become cancerous. Is there such a condition? Are we justified in stating that a pre-cancerous dermatoses will eventually become malignant? Probably not. But do we not see too many malignancies develop from an antecedent lesion or defect to pass them as coincidences?

Bloodgood states that every case of cancer of the skin of which he has a complete record originated from some abnormality of the skin, and not from normal epidermis. This statement of that noted surgeon proves, at least, that if all harmless, cutaneous growths, as well as those known to be dangerous, were removed, there would be fewer cancers of the skin.

Perhaps it is no longer necessary to emphasize to the medical profession the importance of such potential lesions, but it may still be of interest to point out in some detail the characteristics of certain abnormalities seen in my own practice, as well as in that of others, which have shown distinct tendencies to become malignant.

Also, to those of us who are constantly observing skin malignancies, two facts continue to stand out on which we may base some conclusions as to etiology; viz., the importance of irritation and predisposition.

Of course, the pathology of the skin and the contiguous mucous membranes where malignancies may occur, varies, as will be seen in the following paper where the dangerous members of this group, commonly termed "Pre-Cancerous Dermatoses" will be mentioned, and briefly discussed.

MOLES: (Pigmented and Non-Pigmented),

It is now generally known by physicians that the most virulent form of malignancy develops from pigmented moles, either acquired, or congenital. Although globular, hairy, non-pigmented moles become malignant only infrequently, yet if they are in a position where they are being constantly irritated, or, even when they are not, if they show any signs of ulceration, they should be removed at once, as they too may become cancerous. For many years before it was known that the malignant melanomata came directly from pigmented moles and nevi, the fact was realized, in a way, from another point of view; i. e., that they came from the skin, and were pigmented. For the direct derivation of melanomata from pigmented moles, we are indebted to two surgeons. Keene and Bloodgood. They recognized this in 1903, and removed such lesions as good prophylaxis.

Unna also wrote as follows in this connection:

"Since the melano-carcinomata of the skin always take their origin in pigmented moles, and on the other hand, there can hardly be nevo-carcinomata completed without pigment, it is well to describe together these two groups of tumors which are combined by gradual transitions, and, further, in every respect the character of the two is the same. In fact, in all cases we are dealing with rapidly growing, pigmented carcinomata, of alveolar structure, which soon lead to infection of the lymphatic glands, and more or less melanotic metastasis of fatal termination."

When such pigmented areas begin to grow, or ulcerate, the early changes are often so gradual that they are not observed before metastases have taken place. The latter may be found in the viscera and lymph glands, as well as on the skin. Earlier, it was thought, commonly, that there was no glandular involvement, but we now know that is not so.

The early changes in the mole may begin without irritation or trauma, and sometimes, too, this early ulceration may partially heal, and be surrounded by a deeply pigmented area. Thus the lesion may remain inactive for some time, for as long as two years in a case recorded by Hartzell.

According to some authorities, where metastases proceed very rapidly on the skin (on which many pigmented spots appear, almost at once, varying from the size of a bean to that of an egg), numerous visceral metastases will also take place immediately, from the results of which the patient speedily dies.

On the other hand, when there is a large initial lesion, with marked metastases in nearby glands, the patient may live for many years, with very slow development of further metastases.

The pathology of such growths is not clear. Recent investigations indicate that the majority, if not all, of the malignant, pigmented growths which spring from moles, and which, in the past, have been considered sarcomatous, are pigmented carcinomata. Fordyce believed that there may be a two-fold origin for nevi, and would class the pigmented, malignant growths, for the present, as melanomata.

LEUCOPLAKIA

Leucoplakia is another disease any patch of which may prove to be an initial stage of epithelioma. At the same time, as you well know, this disease may remain inactive for months and even years, resisting all treatment and recurring after complete removal.

The epithelium thickens, and becomes keratinized into plaques which may vary from a dull slate color, to pearly, or silver white. These plaques, covered with a pellicle which is adherent to the epithelium, appear as streaks, bands, discs, etc., and are likely to be

*Read before the Jefferson County Medical Society.

irregular in shape. The surface may peel off in flakes, and is usually smooth, and slightly raised from the surrounding mucous membrane of the palate, inner surfaces of the cheeks, the dorsum and sides of the tongue, the commissures of the mouth, and the lower lip, in all of which positions it may be found.

Of special interest is the so-called "smoker's patch," described by Butlin as occurring on, and most frequently near the center of, the tongue. At first this patch is a smooth spot which may be a bluish white, pearly, or erythematous area. Although the lesions most often appear smooth and pearl-like, they are stiff and rough to the touch of the tongue or the fingers. They are not usually tender or painful until they become much thickened, when fissures and cracks form. The latter extend downward into the derma. with resulting inflammation and distress. It is at such points that ulceration may result in epitheliomata.

Irritation is the undoubted immediate cause of leucoplakia, and the following agents are most common: tobacco (chewing and smoking), the sharp edges of broken teeth, as well as dental caries, and, in fact any marked defect in oral hygiene may bring it about. It is almost exclusively a man's disease. Very few cases have been reported in women. For example, Ormsby only reports one such case in his entire experience. It usually occurs after middle age.

Syphilis is often considered as one of the causes of this disease, and certainly it may be said that it occurs in syphilitics. However, the lesions there are the same as in non-syphilitics. The two cannot be differentiated clinically, or with respect of their response to treatment.

As to the pathology, it has not been definitely shown whether the primary change is a pure hyper-keratinization of the epithelium, or an inflammatory process of the papillary layer. That is, some investigators think that the horny layer is only the result of a change in the epithelium below the fissure.

SENILE KERATOSIS

Under this heading may also be included seborrheic keratosis, senile warts and horns. "Old Age Skin," so-called, and the addition of some irritating agent may produce a condition which will, in time, become in many cases, malignant.

These keratoses are more commonly found on the exposed parts of the skin; i. e., the face, neck and backs of hands. Of interest is the "sailor's skin," called so because found on the weathered faces of sailors. Farmers and any who are exposed to the weather, may show this same phenomenon, but again, others just as much exposed to it may present no keratosis whatever.

The lesions are flat, slightly elevated, and crusty in appearance. Under these crusts the skin is tender, and bleeds easily. They may be brown or blackish in color. Any inflammation shows that these areas are becoming epitheliomatous, and sometimes the epitheliomas themselves may be found more or less fully formed on removal of the crust-like covering. The latter is usually dry, but may be greasy. The sluggish appearance of these keratoses leads physicians often to ignore or neglect them until, in some case, epitheliomata are too far advanced for efficient treatment. The earlier they are removed, the better, of course.

Their pathology is marked by degeneration of the epithelial cells, and often then the underlying connective tissue as well. When the latter is really rarefied, there is little doubt of tumor formation.

The cutaneous horns may occur in infancy as well as at middle age and from normal skin as well as from scars, but the possibility of their also becoming epitheliomata at any time should always be borne in mind, particularly as they are themselves metamorphoses of epidermal cells. In some cases horns have been reported as growing outward from epitheliomata, more often on the backs of hands of laborers, who work in the earth.

XERODERMIC PIGMENTATION

This disorder appears early in life, usually before the end of the first year. The first symptom is marked freckling, associated with dryness of the skin. The capillaries are also dilated. Later warty growths develop; for the most part, carcinomatous, and the patients usually die before the age of five is reached.

Persons subject to this disease have a hypersensibility to the sun's rays. It seems that this lowered resistance is dependent upon the blood relationship of the parents.

ARSENICAL KERATOSIS

It has long been known that there is a relationship between the internal administration of arsenic and the subsequent development of keratosis and epitheliomata of the skin. The predilection for keratosis in this case is on the palms and soles, although it may be also more or less generalized.

The characteristic picture shows excessive dryness and desquamation of the palms and soles, followed later by elevated, horny lesions. A malignancy following the giving of arsenic internally is usually of the prickle cell type.

Care must always be exercised in prescribing arsenic over a long period of time.

BOWEN'S DISEASE

This lesion appears in well defined patches which may be single or multiple. They are characterized by the development of firm pinkish or reddish papules which are covered by a thick, horny layer, and they tend to form

rounded, nodular lesions. When the crusts are removed, they leave a dull reddish, oozing, granular surface.

These lesions spread by peripheral extension, and result in cancers of the prickle cell type. They should be entirely removed.

SYPHILIS

Malignancy may develop upon syphilitic ulcers or scars. It is rare on an active gumma, but occasionally on scars resulting from destructive syphilitic lesions, and of course it is common on leucoplakia in syphilitics.

LUPUS VULGARIS

It is reported that 2 to 3% of lupus vulgaris cases develop into carcinomata. And that they usually develop on the scars of this disease only after several years standing. The number of cases of cancer have increased in lupus vulgaris since the introduction of x-ray and radium in its treatment. Several other factors besides the disease itself should probably be taken into account in this connection, viz., old age, x-ray, radium and light-rays.

LUPUS ERYTHEMATOSUS

There are a few cases of malignancies developing in lupus erythematosus, but they are much rarer than in lupus vulgaris.

Malignancies may result from other lesions such as chronic leg ulcers, varicose ulcers, bed sores and cicatrices from third degree burns (i. e., Marjolin's ulcers).

It is well also to mention x-ray and radium as agents in the formation of carcinomata. Malignancies resulting from their use were seen more often in the early days of x-ray and radium workers. They are well known, and, as you have all seen, are characterized by pigmentation, atrophy and telangiectasis. These symptoms are followed by harsh, dry skin, and the nails become brittle; later small, horny growths appear. They progress, usually, to the prickle type of carcinoma.

TREATMENT

I have not given any methods of treatment for these different lesions. Whether surgery, radium, x-ray, fulguration or carbon dioxide snow is used will depend upon the choice of the physician, and results will be shown by his skill and judgment.

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DISCUSSION

C. Brooks Willmott: Dr. Kelly has certainly given us an excellent resume of the subject of pre-cancerous dermatoses. I am sure not all surgeons will agree with him in regard to the treatment of surface lesions, but I do not care to discuss that feature. Each case must be considered individually. Personally, I do not believe prickle cell cancer should ever be treated by surgical removal. Radium or the roentgen-ray is the proper method of treatment.

The principal feature about these so-called pre-cancerous dermatoses is early diagnosis. In other words, just as soon as they begin to show signs of irritation they should be treated by one method or another according to the judgment of the dermatologist. Senile keratosis, leucoplakia and various other types of skin lesions usually occur after irritation of long duration and are characterized by the formation of a scab or exudate. When the scab is detached by trauma or otherwise it promptly reforms. After a few recurrences a slight ulceration is noted, when the scab is detached.

Edward R. Paimer: Several interesting points were mentioned by Dr. Kelly in his paper. As to the relationship between syphilis and so-called pre-cancerous lesions, particularly leucoplakia. We recognize that any constant and prolonged irritation offers the ground work for both these diseases. Unquestionably chronic syphilis furnishes a very fertile field for the development of leucoplakia.

Leucoplakia is an extremely interesting lesion and is quite commonly seen in syphilitics. However, I do not believe—and I am sure Dr. Kelly will agree with this statement,—that syphilis is the cause of leucoplakia. That leucoplakia is so frequently noted in syphilitics is due to the fact that syphilis offers a fertile field for its development. Every person in whom leucoplakia develops would have had leucoplakia just the same whether he had syphilis or not. That has always been my opinion.

I have under observation at present a man who had syphilis twenty-five or more years ago. He has always been a constant smoker and now has a persistent leucoplakia inside the mouth and over the tongue. Under antisyphilitic treatment the lesion at times will improve, then later return to its original condition. I have told the patient I did not believe if he took antisyphilitic treatment the remainder of his life, he would get rid of his leucoplakia. I wish Dr. Kelly would tell us in closing just what would be the best line of treatment in such a condition.

I have certainly enjoyed the paper very much.

Robert L. Kelly, (n closing): Referring to Dr. Palmer's remarks. Leucoplakia is noted just as commonly in the non-syphilitic as in the syphilitic, and as he said antisiphilitic treatment has no permanent effect on the leucoplakia. Improvement may occur at times, but the lesion eventually returns. I think the best treatment for leucoplakia is to let it alone until signs of irritation or degeneration are manifest indicating the possible beginning of epithelioma. When that stage is reached, fulguration, the cautery knife, or radium may be used. My preference is for fulguration or the knife. I have seen radium used, but the lesion always returned. The patient should be advised to abstain from smoking or chewing tobacco, also cautioned about eating and drinking things that might cause irritation and thus aggravate the lesion.

We are prone to speak rather glibly of dermatoses as pre-cancerous lesions. There is no way to prove they are pre-cancerous, although we know that many of them do degenerate and become malignant. As soon as signs of irritation appear, all these lesions should be removed. The method by which this is to be accomplished must be left to the judgment of the operator.

I thank the gentlemen for their discussion.

SUBDIAPHRAGMATIC ABSCESS. PNEUMONIA. CASE REPORT*

By J. GARLAND SHERRILL, A. M., M. D., F. A. C. S., Louisville.

This report is brought to your attention because of the fact that the diagnosis was made by the unusual findings on physical examination and their confirmation subsequently by the roentgen-ray. While similar findings were noted some years ago in a case of Dr. Heflin's, demonstrated by the x-ray (Dr. Keith), I cannot recall such an observation in literature. This case also shows the value of roentgenoscopy in many of the obscure intra-abdominal and pulmonary lesions.

(1) A man aged 58, gave a history of very good health except pneumonia years ago followed by empyema left side, good recovery from operation. For the past two years he has had attacks of pain and soreness in right side with gas formation after eating, sour stomach and constipation. His appetite was good, yet he was very thin. He takes no alcohol but chews tobacco. No urinary bladder trouble; no worms.

Present illness began three weeks ago with sudden pain three inches below rib margin on right side, followed by chill, fever, sweating. He remained in bed while pain and fever persisted. He took a purgative every day during this time, until Sunday, October 14th, four days before he entered the Baptist Hos-



pital, with free catharsis. He has lost considerable flesh, sweats every night, has a very slight hacking cough, no expectoration. Stools are green with offensive odor.

His abdomen was examined and it was decided he had enough symptoms to indicate an intra-abdominal lesion. Liver dullness was normal in extent but reached below rib margin. In examining the chest an area of tympany was found in the right midaxillary line extending above the fifth interspace in which there were no breath sounds. There was nothing to indicate that he had pneumonia or empyema, and it was concluded he had a subdiaphragmatic abscess probably the result of acute appendicitis or a duodenal ulcer with perforation.

In order to clarify the situation Dr. Keith was asked to make an x-ray examination, and the pictures which will be shown on the screen, give an outline of a gas shadow between the liver and the diaphragm. I have seen the demonstration of a similar case by Dr. Keith of subdiaphragmatic abscess occurring after operation for appendicitis, and he has that picture in his collection. There may have been other cases reported, but none could be found in my study of the literature.

At the time this patient came under observation his blood count showed: erythrocytes 3,400,000, leucocytes 10,050; polymorphonuclear cells 72 per cent. Urinalysis: reaction acid, specific gravity 1008, some albumin, few hyaline casts, mucus, blood and epithelium. Smears showed a mixture of organisms, large and small staphylococci, streptococci, a few bacilli.

Fluoroscopic observation (Dr. Keith) shows diaphragm on left side smooth in contour and

*Read before the Jefferson County Medical Society, February, 18th, 1929.

with normal range of motion. On right side just beneath the diaphragm is a gas shadow, which certainly indicates a subdiaphragmatic abscess. Liver shadow below the abscess practically normal. In addition to finding liver dullness overlapped by tympany rather low there was diminished expansion of the right side on physical examination.

Operation October 18th, right abdominal incision, some adhesions to right parietal wall, liver and colon. The appendix was inflamed and connected with an abscess in right iliac fossa and along retrocecal space extending into subdiaphragmatic space. The appendix was removed. Some pus and gas escaped when the liver was separated from the diaphragm. The cigaret drains placed in subdiaphragmatic space and one in abdominal cavity. Adhesions between liver and gall bladder were separated just sufficiently to determine that the patient did not have gall bladder disease. Owing to his emaciated and extreme condition it was believed inadvisable to explore the stomach and duodenum, the conclusion being reached that the appendicitis was the cause of the abscess.

The patient left the operating room in fair condition. The dressings became soiled and were changed about four o'clock that afternoon. There was a discharge of bile-stained fluid which in itself should have aroused suspicion.

The next day, October 19th, the patient's condition became very serious due to exhaustion. On the 20th orange juice was given at 8 a. m., and almost immediately the drainage resembled orange juice in color. Methylene blue given by mouth escaped through the incision. This demonstrated that the patient had a perforated duodenal ulcer, and clarified the causal factor.

Unfortunately the man died, but I think we can learn enough from the case, regardless of the fatal outcome, to justify its report. The diagnosis of subdiaphragmatic abscess was correct, but in addition there was a perforated duodenal ulcer. Could this man have had an early operation or had the diagnosis been properly made in the beginning, and the proper treatment applied, his life might have been prolonged.

(2) Another case is presented in which I believe "I did myself proud." A physician who is a careful observer and competent diagnostician, sent me a child about nine years old with the following note: "This case is suspicious of appendicitis; the child has some symptoms that look like appendicitis, and some that are confusing and not clear." The patient was sent to the Baptist Hospital and

no operation was performed, because the diagnosis was promptly clarified. The child had a temperature of 104° F. The leucocyte count was 26,400; polymorphonuclears 86%, lymphocytes 11%, endothelials 4%. He complained of little pain and muscular rigidity was slight. Examination of the chest showed no rales. I at once discovered, about two inches above the liver, a small dull area with tubular breathing, clearly a pneumonia, and this was confirmed by roentgen-ray examination. "The changes seen in the (right) middle lobe are quite characteristic of an early pneumonic process with thickening of the pleura." (Keith).

To make a long story short, the child had pneumonia and made a satisfactory recovery by crisis on the seventh day.

PLACENTA PREVIA*

By SILAS H. STARR, M. D., Louisville

Placenta Previa is generally recognized as one of the most dangerous complications of pregnancy. It was a complication recognized even by Hippocrates, but he thought it was a detachment of the placenta from the uterus high up, with a prolapse of the detached portion over the cervix. This was the generally accepted view until 1685 when Portal described the condition as we know it today—the implantation of Placenta, or part of it at least, in the lower segment or dilating portion of the uterus.

The incidence of Placenta Previa varies widely according to different authors. At the Kiel clinic in twelve years there were 9608 labors with 160 placenta previa or .75%. Lomer, Tarnier and Burger and Graf estimated its incidence as once in 723, 207, and 130 labors respectively. Williams estimated it as once in 1000 labors in private and once in 250 cases in hospital practice. Thompson's statistics for Johns Hopkins Hospital show 66 cases in 1000 deliveries or .66%. In 9500 deliveries that I analyzed in Bellevue Hospital, there were 69 placenta previa, an incidence of .73%.

There are three varieties of placenta previa; the marginal, where only a brim of the placenta impinges on the internal os; the lateral or partial, where the placenta covers a portion of the os; and the complete or central, in which the placenta completely covers the internal os. Strictly speaking the central variety cannot be diagnosed until the internal os is sufficiently dilated to permit one to feel the attachment around the entire lower segment.

*Read before the Louisville Obstetrical Society.

Pinard stated that he never met with a true central previa, but the incidence of the central according to most authors is about 20%.

Placenta previa is supposed to occur because of an old endometritis or some change in the endometrium, which prevents the attachments of the placenta in its normal place on the wall of the uterus. It occurs much more frequently in multipara than in primipara, and is especially frequent in those women who have a number of children in a relatively short space of time. Considering this fact, it seems that not only is inflammation an etiological factor but that the endometrium has not had sufficient time to prepare itself for the reception of the fertilized ovum. This also would apparently lead one to suspect a repetition of placenta previa in subsequent pregnancies. There is very little mention of this in the literature, however. In my series of 69 cases, two gave a history of previous placenta previa. Marshall reported three successive placenta previa in one patient. In view of the fact that so little mention is made of repeated placenta previa, it would be interesting to note how many patients who have had the condition, become pregnant again.

The practically constant symptom is hemorrhage, which is usually painless. DeLee says that "a painless, causeless, uterine hemorrhage in the third trimester of pregnancy is almost pathognomonic of placenta previa." The bleeding at first usually shows itself as spotting, or loss of only a small amount of blood which may be repeated several times before labor begins, or before there is an appreciable amount of blood lost. However, there are a number of exceptions to this, and some patients are reported to have died from a single profuse hemorrhage. In partial and complete previas the descent of the presenting part is obstructed, and it is felt as a mass above the brim of the pelvis. Because of this and because of the number of premature babies, the relative frequency of malpresentations is usually increased. The cervix is usually anterior very soft, and very friable. The diagnosis can be made positively only when the placenta can be felt over the internal os on vaginal examination.

The prognosis for both mother and child is grave; in fact the fetal mortality is indeed so high even the cases where at the time treatment was instituted, there was considered a fair chance for the baby, that at some clinics the treatment is solely in the interest of the mother. According to most authors the maternal mortality varies from about four to twelve per cent; the gross fetal mortality is estimated from 40 to 75%. At the Kiel clinic with 168 cases 31 were sectioned with one death, and one hundred and thirty-seven without section showed 15 deaths. Kosmac

in 534 cases at the New York Lying In Hospital from 1904 to 1918 shows 14% maternal mortality and 41% fetal mortality. Thompson at Johns Hopkins shows 10½%. Kellogg at the Boston Lying In, reported two series. From 1895 to 1915, the mortality was 19%, from 1915 to 1925 it was 8.25%. In the former period the popular method of treatment was accouchement force, in the latter period, the bag and bipolar version were the treatment.

The cause of death in babies is asphyxia, and asphyxia plus prematurity. Hemorrhage and sepsis are the two frequent causes of death in the mother. The hemorrhage may be due to laceration of the the cervix extending up the lower uterine segment; this cause was extremely frequent when accouchement force was practiced. Some writers think that hemorrhage may occur frequently due to dilatation of the lower segment, while others look upon this as a most infrequent cause.

Kellogg describes the typical placenta previa death and gives his theory of the causation. On this theory our treatment may be based. "Delivery is accomplished, the placenta out, pituitrin and ergot given, the fundus held, the cervix pulled down with hooks, inspected found intact or laceration repaired to top, fundus, cervix and vagina packed or not, as you choose, transfusion or not, as indicated, patient in fair or good shape, prognosis good barring sepsis. One half to three hours later, bleeding, rising pulse or lower pressure softening fundus; re-examine, intact cervical ring, pack or re-pack pituitrin and ergot, transfuse or retransfuse, consider hysterectomy, condition too poor, sudden persistent softening of whole uterus, death." This is the exact picture of two patients whom I have witnessed die from Placenta Previa. Kellogg states and DeLee and others agreed that enough patients die in this manner to discourage one in an otherwise favorable case with delivery from below. In view of the difference of opinion as to the actual cause of this hemorrhage, the report of autopsies observed by Caldwell and described by Kellogg, is very interesting; an intact or well repaired external cervical ring, but above in the lower uterine segment a split at the placental site into the uterine musculature, permitting hemorrhage from large deep vessels and sinuses. Kellogg believes further that this explains the reason for the interval between the end of the third stage and the profuse bleeding. He also explains why the pack does not control bleeding; because when the pack is introduced and the uterus contracts, the bleeding ceases, and when the uterus relaxes, the packing is not against the deep, partially buried bleeding vessels.

Sepsis is far more frequent in placenta

previa since the uterine sinuses are down near the cervix, and are favorable inroads for infection. Brodhead emphasizes the morbidity in placenta previa and states that many patients are invalids for a long time. DeSnoo states that in 14 women delivered the same day, that the first bleeding occurred, there was no morbidity, of 42 delivered within three days, two showed morbidity; and in 86 delivered later, 19 showed morbidity, and six died.

In view of the high mortality to both mother and child, the management of the case is of the utmost moment. We have little prophylactic treatment for this condition, as we have in eclampsia and toxemia. Cut down endometritis and secure well involuted uteri. It is a condition which exists in a certain number of cases and must be treated accordingly. Each bleeding case must be looked upon as having a possibility of serious hemorrhage, and blood should be typed of patient and possible donors as soon as the condition is suspected. Titus goes so far as to recommend typing the blood in normal cases within six to eight weeks of the expected delivery, so that if transfusion is necessary there will be no delay.

The treatment depends upon various factors; the type of the previa, the parity of the patient, the condition of the patient when first seen, the number of weeks of gestation, the condition of the cervix. All writers agree that a patient with placenta previa should be hospitalized. Those cases in active labor with some dilatation and a marginal previa, can usually be successfully treated merely by rupturing the membranes. It is the partial and complete type that most concerns us. It is interesting to note the routine treatment at the Rotunda in Dublin. It is solely in the interest of the mother. It is as follows: If the cervix is closed, and bleeding occurs, plug vagina tightly and apply a binder. Within eight to twelve hours, remove the packing and only in the very exceptional cases the cervix will not be two fingers dilated. Do an external version if the breech does not present. If this is impossible, do a Braxton-Hicks or combined version and pull a leg down. If bleeding continues apply a binder and put an elastic on the leg, then allow spontaneous delivery to occur. In 171 cases treated in this manner the mortality was 6%; the fetal mortality however was about 75%. At present the favored methods are the bag and combined version in Europe, while in this country, the bag is the most frequently used. During the last few years however, Caesarean Section has come more to the front and is probably the choice method in cases where the condition is recognized before labor is far advanced. As mentioned before DeLee looks upon it with great favor and in view of the greatly im-

proved mortality rate for the mother, but more especially for the baby, it appears to be the method of choice. Bill in a recent article, brought out two interesting and important points in treatment. First he recommends a prophylactic or therapeutic transfusion in all cases where there has been an appreciable blood loss. Before attempting any manipulation he insists that the red count be over three million and that the blood pressure be at least 100-60. Second, in view of his experience with delivery from below he unqualifiedly recommends section for all cases not in advanced labor. He makes only a rectal examination to confirm the diagnosis. Since 1922 following this course of treatment in 71% of cases his mortality rate was 1.78% with 56 cases treated. In a series he compiled before 1922, when this treatment was not in vogue, in 45 cases, the mortality was 11.1%.

In cases delivered from below where there is intractable hemorrhage, a method has been described of ligating the uterine arteries from below. Kerwin reported a case of this kind while Harold Miller, who did this operation in 1907 reports 11 cases. This is put forth as a contra indication to Caesarean section, but it seems to me that the latter is in reality more conservative.

In closing I might enlarge upon the objection formerly spoken of in regard to Caesarean section. Before the perfected technique and strict asepsis infection was the all fearing factor in section. With better hospital facilities more skilled surgeons and better methods of operation, Caesarean section is much less dangerous and infection not so greatly to be feared.

I might mention a former method of treatment only to condemn it. That is Accouchement force. Until fifteen years ago this method of treatment was practiced generally and was the cause of our frightful mortality rate because of the deep tears sustained in dilating forcibly the soft friable cervix.

CONCLUSIONS

1. Placenta Previa is a very grave complication of pregnancy both for mother and child.

2. Its incidence cannot be estimated accurately.

3. The etiology is probably an abnormality in the endometrium.

4. Antipartum painless uterine hemorrhage in the last trimester of pregnancy is almost pathognomonic.

5. As in nearly all medical conditions we must individualize in treatment, but more and more is Caesarean section being done and apparently with good results. It is important to restore lost blood and combat shock by transfusion before radical operative procedures are attempted.

6. Accouchement force is definitely and always contraindicated.

7. Death in mother is due to hemorrhage or sepsis; death in baby is due to prematurity and asphyxia.

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HOW SHALL WE INTERPRET THE WASSERMANN REACTION?*

By EDWARD R. PALMER, A. B., M. D.
 Louisville.

In Hazen's "Syphilis" (1) Colonel Charles F. Craig makes the following statement: "We now know that treatment applied before the appearance of secondary symptoms is much more apt to prove successful than after such symptoms appear, and the physician who waits for the appearance of secondary symptoms before beginning treatment when it is possible for him to have a dark field examination made or Wassermann test applied is criminally negligent."

So strong an indictment should be based only on absolutely demonstrable scientific facts, and the assertion "we now know" should not be made unless the evidence supporting it is undisputed. That such is not the case, in the question involved, all unbiased physicians must admit. For, while it is the belief of the great majority that this method offers the best promise of a cure, still, it is only a belief, which in my opinion is founded on unproven theories and deductions from them, that is to say the least are open to question.

Although not disposed to be controversial, yet in view of the fact that the method of handling this disease, which Craig so harshly condemns, is the one I am still following, I feel it incumbent on me to do all I can to defend myself from an unjustifiable imputation.

In a recent paper (2) I advanced what seemed to me strong arguments against early intensive treatment. The discussion which followed brought out the fact that the opinions of neurologists in regard to the cause of the increase in the incidence of neuro-syphilis were apparently in accord with the views I expressed. Attention was also called to

Warthin's (1) findings in autopsies on syphilitics and his statement that as a result of his observations he had become extremely pessimistic as to the curative effect of any of the modern methods of treatment, it being his belief that the only effect such treatment had was to render the disease latent.

Inasmuch as Warthin's views are quoted in the same volume as Craig's and that the opinions of neurologists of the gradual increase of neuro-syphilis are well known, before claiming "to know" modern treatment is superior to deferred, Craig should at least have answered these objections.

In the following essay I shall still further place the burden of proof of the incorrectness of my views upon the advocates of the early intensive method. When they have shown my arguments and deductions fallacious, and at the same time proven theirs to be true, then and then only can the charge "criminal negligence" be brought against me.

Following the discovery of the spirochaete pallida, Wassermann, Neisser and Brouck applied the complement fixation test of Bordet and Gengou to syphilitic sera, using as antigen extract of fetal syphilitic liver, with successful result. This was at first thought to be a true antibody-antigen reaction until reports began to come in of similar reactions following the use of extracts of normal tissues and of reactions occurring in some other diseases. This, of course, proved that it was neither a true reaction nor a specific one. However, since the conditions other than syphilis in which it occurred could generally be ruled out, it was universally acknowledged that as a diagnostic procedure an epoch-making discovery had been made. Soon its field of application began to broaden, until at the present time Wassermann enthusiasts have placed it on a pedestal, bowing down before it as though it were a God. Now not only diagnosis but also treatment and even prognosis come under its sway.

This usurpation seems, according to Oettinger, to have been first fostered by Citron, of Berlin, in 1911, since when it has been widely supported both in this country and abroad. As a result the diagnostic acumen of the physician has been relegated to innocuous desuetude, while between the testubor of the laboratory and the ampouler of arsphenamin his skill as a discriminating therapist is of very little use.

No longer is "watchful waiting" the word, but "up and at them boys" with hand grenade of mercury and poison gun bombs of arsphenamin annihilate the pesky spirochaete with true twentieth century expedition. Quarantine the syphilitic, sterilize him, make him quickly non-infectious or else with Mr. Manteline we will all soon be going to the

*Read before the Cumberland Valley Medical Society.

"demnition bow-wows."

In this age of standardization it is old-fashioned—old-fogeyism to consider our patients individually. The time-honored custom of carefully studying and treating them for syphilis has passed and in its place we now with scientific exactness treat syphilis for them. Just so many intravenous doses of arsphenamin, followed by so much intra-muscular mercury, with perchance an occasional intra-spinal administration of salvarsan.

(2) serum, this regulated and controlled frequent applications of the Wassermann, and all will be well.

'Tis a consummation devoutly to be wished for but as yet unfortunately not reached. For our enthusiasts much acknowledge that it all depends upon whether the Wassermann really indicates what they believe and whether it is infallible. The modern school of syphilologists is assuming as demonstrated truths certain postulates which are far from being proven.

(1) A positive Wassermann reaction is, *per se*, a harmful state of affairs which should be prevented from occurring, or if already present, rendered negative as quickly as possible and kept so.

(2) In a person who has had syphilis it always indicates active living spirochaetae and therefore calls for more and stronger treatment; a negative, on the other hand, only means a cure according to your own method of looking at it.

(3) In primary syphilis, providing an arbitrarily determined number of doses of arsphenamin and mercury have been given, a negative indicates the abortion of the disease.

(4) Treatment changes a positive to a negative by directly killing the spirochaetae, the exciting cause of the baneful four-plus.

(5) Whether a case has been cured or not can be determined by a provocative injection of arsphenamin, a positive reaction denoting latent or encapsulated foci of spirochaetae that have been liberated and stimulated to activity, while a negative points to a cure.

(6) Herxheimer reactions, early and later neuro-recidives are caused by endo-toxins resulting from the destruction of spirochaetae by the drug.

(7) The reaction is not only qualitative but also quantitative, the number and activity of parasite being in strict ratio to its degree.

Such are the postulates dogmatically assumed to be beyond question of a doubt, upon which as a foundation the whole superstructure of modern diagnosis, prognosis and therapeutics of syphilis is erected. Are they valid? By no means. Clinicians have fallen into the serious error of allowing the labora-

tory to interpret this reaction and to dictate the method and duration of treatment according to their explanation of its cause and the manner in which its changes following treatment are brought about.

This is not said for the purpose of belittling their valuable institution, for most of the great advances of modern medicine and surgery are the result of laboratory discoveries. It is essential however, that its place in the practice of medicine be properly designated. Therefore, clinicians must insist that they only shall be the interpreters of such investigations and the judges of their significance in the case at hand.

That this reaction is not the reliable guide for treatment and prognosis as is claimed I shall now demonstrate by quoting various authorities. It is my contention that this is due to an improper interpretation of their valuable discovery, and should I succeed in substantiating this it will be evident that the modern method of treatment is far from being an improvement on the deferred chronic intermittent plan.

All positively known of the Wassermann is that it is a reaction between lipoid-globulins. Craig says (1): The test appears to consist of a reaction between lipoids present in the antigen and lipotropic substances present in the blood serum of syphilitics. Since lipoids are normally present in blood serum it is evident that the difference between normal and syphilitic serum is one of degree and not of kind.

What is the source and nature of these lipoids? According to Levaditi and Yamanouchi (4): The reaction is caused by substances of histogenic and not microbic origin resulting from tissue changes caused by present or past action of spirochaetae.

Thiel and Embleton (4) conclude: That the so-called anti-body is not a true one and is not characteristic of syphilis, but is probably a stage in the formation of anto-complementary combination.

Noguchi (4), using an antigen made from cultures of spirochaetae, has demonstrated that there is a true reaction, which, however, is so difficult to obtain that it is of little practical value.

McDonagh (5) has shown that the chief source of these lipoids is the lymphocytes. He believes that they are probably the materials from which antibody is formed. His theory is that complement is the one protective mechanism against all invading micro-organisms; that it is a lipoid globulin and an oxidizing ferment. Micro-organisms are destroyed by hydrolysis and oxidation of their lipoid globulin content through ferment action.

As is well known ferments are specific in character, this probably being due to their

chemico-molecular structure. So in order that complement may be able to bring its ferment action to bear on the particular micro-organism it must adapt itself to it by rearranging and building up its lipid globulin until it has a stereo-chemical and molecular configuration homologous with that of the parasite. This is accomplished by absorption of the lipid globulins that have been discharged into the plasma by the lymphocytes. The initiation of the formation and discharge of this substance is due to the activity of spirochaetae, but its continuation is not necessarily dependent on the presence of living parasites.

The whole theory of immunity is based on the fact that once its mechanism is started the production of antibodies if often continued long after the exciting cause has been removed. This is the case in typhoid fever, gonorrhea, tuberculosis, diphtheria and practically all other diseases. Why, then, should syphilis be excepted? On this point McDonagh (5) remarks: If the infection is severe the production of reagin often continues throughout the patient's life. This does not mean that the patient has active syphilis. From this it follows that a positive reaction is by no means always a harmful state of affairs; that it does not necessarily indicate active syphilis, and therefore, cannot per se be relied on as a guide for treatment.

As Marshall (4) says: If the Wassermann specific for syphilis it is best to look upon it as indicating a previous infection. To regard it as evidence of virulent syphilis in a person with no signs or symptoms of the disease and therefore an indication for treatment, is to attach far too great importance to its value.

Statements like these by two of the foremost English authorities cannot be brushed aside or glossed over. It must be that the wide belief in the essentially evil significance of this reaction is due to the profession at large being unaware of the fact that many of the best authorities on syphilis are opposed to this view. Besides those quoted may be mentioned Keyes (6), Henes (7), Oettinger (3), Wile and Hasley (8), Pollitzer and Spiegel (9). All agree that the reaction does not necessarily indicate active syphilis, and that even where it does, drastic treatment is not always called for. They call attention to the fact that in latent syphilis with no symptoms but a positive reaction, and in certain forms of neurosyphilis, too intensive treatment is likely to be followed by disastrous Herxheimer reactions.

To my mind these are best explained, not by the commonly accepted theory of liberated endotoxins, but by a premature discharge and exhaustion of antibodies. In latent syphilis

a balance of power has been established between the spirochaetae and the antibody mechanism whereby the former are held in check. Treatment by its powerful catalytic action upsets this balance without destroying all of the parasites and before the body can manufacture a fresh supply of antibodies the remaining spirochaetae become active with the resulting neuro, cutaneous, or other reactions.

How, then, shall we explain this reaction? What does it mean? When we consider the many conflicting views concerning it, the frequent discrepancies between serologic and clinical findings, its great variability in the same individual from time to time without corresponding symptomatic changes, the most plausible interpretation seems to be that it is a reaction of the protective machinery of the body against the invading organisms.

We can thus readily understand why the degree of this reaction does not always necessarily correspond with the number and activity of the spirochaetae, for this in reality is simply an index of the ability of that particular individual to react. So we find a great variation in the time of appearance of the reaction; cases with marked syphilitic symptoms but negative reaction in which the antibody mechanism fails to respond to the stimulus in the characteristic manner; latent syphilis with absolutely no symptoms but strongly positive reactions, this because the body having become accustomed to form antibodies responds in full force to comparatively few active spirochaetae; permanently positive reaction in which the impression on the mechanism has been so strong that it continues to produce antibodies in the absence of any stimulus.

If, then, this is a sign of antibody formation, should treatment be directed against it? Is the mere fact of keeping it from developing or rendering it negative any proof that the disease has been stamped out? It looks to me as if our modern specialists were not even treating syphilis, their entire attack being directed against a symptom the exact meaning of which has not been determined. If we knew, as is claimed, that early treatment in keeping the reaction from showing up also prevented systemic invasion, there could be but one course to pursue; but Neisser's (4) experiments have demonstrated that the internal organs are involved long before the Wassermann becomes positive.

It is now my purpose to show that the changes in the reaction following treatment do not in any way depend on the presence or absence of spirochaetae or prove they have been destroyed. In my former article (2), I claim to have proven that neither mercury or arsphenamin acts directly as parasitocides,

their action being inhibitory and catalytic and that therefore spirochaetae must be destroyed by antibodies. These being specific substances can only be produced at the initiation of the specific exciting cause after which drugs aid by hastening the velocity of their formation and discharge into the plasma.

In proof of this McDonagh (5) states that arsphenamin increases the amino content of syphilitic sera, which he believes to be due to breaking up of lipoid globulins. This view is supported by the fact that examination of plasma cells after the administration of arsphenamin shows their protoplasm finely broken up. This at first is purely a physical change the parasites being still lipoid globulins. In this state they are discharged into the plasma. So that the first effect of the drug is to increase the strength of the reaction, or if not yet positive to make it so. In no way does the change indicate the presence of spirochaetae, since it is the result of the action of the drug on the lipoid globulins and not on the parasites.

After several doses of arsphenamin its catalytic action goes further, the physical change and discharge is followed by chemical changes, hydrolysis and oxidation with the development of amino-acids and fatty-acids. So that the second effect of the drug is to make the reaction negative; but this in no manner shows that spirochaetae have been destroyed.

These observations and verified experiments show conclusively that the provocative arsphenamin injection is absolutely unreliable. This opinion is concurred in by Follitzer and Spiegel (7) who from tests in one hundred and fifty cases, came to the same conclusion in regard to its value.

There can be but one true deduction from all of this, which is that our drugs act principally on the antibodies and their mechanism. This is shown by other facts. It has long been known that under mercurial treatment in persons of low vitality exhibiting tubercular or rupial syphilides the symptoms instead of improving, seem to become aggravated. When, however, specific treatment was discontinued and tonics resorted to improvement immediately set in. All the anti-syphilitic drugs in the world will not help these cases, while cod liver oil, iron and hypophosphites often act like magic.

A particularly bad combination is syphilis and alcoholism. This is easily explained by the foregoing theory. Craig (1) has shown that beer and whiskey in fairly large quantities will change a positive reaction to negative. The physiological action of alcohol accounts for this and its consequent harmfulness in syphilis. This drug checks metabolism, prevents tissue waste, conserves especially the

proteins and fats, hence it has a tendency to prevent antibody formation as these are the result of lipoid globulin cleavage. It is antagonistic to antisiphilitic drugs because they stimulate and increase such changes.

Finally, after profound ether or chloroform narcosis normal serum is frequently found positive due to these drugs being lipoid solvents.

The conclusions reached from a consideration of these many points are that treatment directed against the Wassermann and regulated by it is misapplied. For in itself it is not a harmful condition, being in normal reaction of the body to the disease. Once the spirochaetae have gained access to the tissues there is but one way of eliminating them, i. e., through the natural protective machinery. The positive Wassermann looked on as a sign that this is in action must necessarily develop in order for a cure to result.

Our treatment, then, should be directed so as to co-operate with and not oppose the forces of which it is the indication. Therefore, early intensive treatment is harmful directly in proportion to its success in preventing the development of it. Fortunately this is rarely accomplished, for in spite of the misdirected efforts of the physician so powerful is this protective mechanism that a positive reaction develops at some time in practically all cases.

So again let me repeat the teaching of R. W. Taylor (10) and Edward R. Palmer, Sr., that the proper time to begin the treatment of syphilis is early in the secondary period, for not until then is the body prepared to successfully cope with the disease.

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VIOLET RAY THERAPY*

By S. S. AMERSON, M. D., Georgetown.

Violet ray energy has a large field of usefulness in surgery as well as medical treatment. Repeated biological irradiation produces a pigmented skin which is practically infection proof. This is of unique value in many cases of joint surgery, where induced infection is present. Irradiation of the wound has a most powerful effect on the germs as well as producing a physiological hyperemia conducive to repair, rapidly. Violet ray tends to rapid healing with very little resultant scar. In fact the ugly rough scars of operation may be largely removed and replaced with all but natural skin by the use of violet ray therapy. That, that was once a stiff scar, made soft and pliable and all but natural skin. Any scar that can be reached with the violet ray may be reduced in length, breadth and thickness. Stitch abscesses respond quickly to violet ray treatment, as well as all septic wounds.

Pain in and about the wound due to inflammation is quickly relieved. Violet ray produces an inflammation different from infection or traumatism and since there is no septic or toxic products and no venous stasis present; perhaps it would be better to use the term active hyperemia rather than inflammation. Even deep seated post operative pain can be relieved by producing a counter irritation over the associated zone. Post operative nausea and vomiting are relieved by violet energy, since it relieves the acidosis. The general toning up of the nervous system improves the patient's morals to a great extent.

Industry has been quick to utilize violet energy. All of the important manufactories and industries have adopted the use of it in the cleansing of wounds and claim infection in wounds has almost ceased. I never dress a wound without first cleansing it with violet energy, and never have an infected wound, then treat them daily to prevent subsequent infections.

Connective tissue wherever found depends largely for its nutrition on an adequate supply of calcium and phosphorus in the blood stream. Violet energy governs calcium and phosphorus metabolism. In all injuries affecting bone, ligament, muscle or connective tissue, violet ray irradiations are beneficial to ensure the necessary chemical compounds in the blood for rapid cures. Nature's method is plenty of good blood to the parts for rapid healing. Violet ray electricity ensures the proper chemical compounds in the blood.

Any bone trouble is benefitted or cured by violet energy. Dis-use is one cause of osteoporosis, or demineralization, which condemns

the use of Plaster of Paris or any demobilizing splint. Natural motion is far the best, when any part is immobilized atrophy of dis-use occurs. This atrophy will be overcome by the use of the violet ray applications, to remove pain and sensitiveness, and supply the proper chemicals in the blood for repair. I have arrested and removed ankylosis; arrested disease of the bone and nature filled out the depression that had decayed away.

Rickets has and can be cured with violet rays. Brittle as well as soft weak bones are strengthened and in time becomes normal if long treated. It has been proven that fractures will heal faster when violet irradiation is used; many times where callus is absent it will occur if violet irradiation is used in time; there by saving amputation. Almost all infections of the tissue can be prevented or stopped by proper treatment with violet ray. Chancre caneroid and gonorrhea are promptly remedied, and the latter cured by violet ray therapy. I have promptly cured cases of gonorrhea of long standing that had resisted all methods of treatment.

Many attacks of appendicitis, gall stone and kidney stone will be tided over operative interference with erythema doses and suitable hygiene will prevent further attacks.

The violet ray will produce vitamins which control conception, intrauterine growth, and maturation of human as well as animals. This being so, one would logically conclude that the violet energy plays a large part in the prevention, alleviation and cure of the diseases met by the pediatrician, gynecologist and obstetrician.

Sore or cracked nipples and abscessed breasts are benefitted and cured. Daily treatments to normal breasts will keep them normal; and if applied to the entire body, will increase the vitamin and mineral contents of mothers milk, which precludes troubles with the babe.

Sub-involution of the uterus is greatly benefited, and menorrhagia and amenorrhea relieved by it; infection of lacerated cervix and the entire vaginal vault benefitted. In leucorrhea and gonorrhea of the female there is no better treatment than the light therapy when properly applied. Removing gonorrhea in the female will lessen the operative procedures for female troubles. Always build the general system as it helps to overcome all troubles.

Violet rays lessens the spread and pain in cancer; I have entirely removed epitheliomas with it. Cancer cachexia, as all cachexias, shows a high elimination of mineral salts, as shown by the x-ray in osteoporosis, a demineralization and increases diffusible calcium to normal. In the anemia of cancer, it tends to bring the red blood cells and hemoglobin to normal. The red blood cells at first remain

*Read before the Scott County Medical Society.

stationary, while the hemoglobin steadily increases. Cancer patients do best when the leucocyte count is normal or above normal. Leucocytosis is increased, the polymorphonuclears are especially increased. This is especially valuable in combating the secondary sepsis so often found in cancer.

Violet energy exert an influence on body metabolism. This is indicated experimentally by:

First, changes in the amount of carbon dioxide expired.

Second, change in the rate and depth of respirations.

Third, the increased rate of growth in light rather than darkness.

The body wasting of cancer is in many ways similar to that in fevers. The nitrogen metabolism is similar to that in tuberculosis.

Since this treatment acts as a metabolic peacemaker, it should be used in cancer cases to adjust and equalize perverted metabolic processes. There is a tendency to acidosis in cancer for it to over come.

Gastric ulcers are treated by surgeons and practitioners and each has excellent reasons for their opinions of cures. Many theories are prevalent as to the cause of gastric ulcers, but none have been proven; but we know the gastric mucosa is attacked, possibly by the acid gastric juices, and an ulcer is the result. Some think focal infection is the cause, as it is today charged with most every thing else, so it may be the cause. A septic emboli lodges in the submucous portion of the gastric wall, producing an infarct which is digested by the acid gastric juices and erosion and ulcer follows. Long continued lack of vitamins undoubtedly lowers nutrition so that infection or irritation may and does produce gastric and duodenal ulcers.

The pain and irritation is readily removed, also acidosis and dyspepsia and the discomfort of so much gas, and without an exception I have relieved or may say cured all cases treated. True, in after years, the same cause may bring another ulcer, as if removed by surgery or any medical treatment.

When ulcer patients are treated with violet energy, it will be found then that much less alkalies are needed and much fuller and more liberal diet can be enjoyed. Can't we readily see that diets that will give trouble to laboratory animals, is not fit for humans, and a diet rich in vitamins and mineral salts as well as proteins, carbohydrates and fats is necessary for humans.

Not too much meat, but plenty of milk and milk products, eggs, fruits of all sorts, nuts, vegetables, especially the leafy sort. Not too much sweets as they satisfy the appetite and not enough natural food is taken.

The eye, ear, nose and throat specialists are

finding more and more use for violet irradiations. Granulated eye lids, conjunctivas of all sorts are cured with it. All painful conditions of the eye are relieved. Most all cases of otitis media are relieved, it is the quickest relief to the pain and I have not failed in a single case to effect a cure, and in many cases prevented an operation. In many cases have relieved mastoiditis without operating, thereby saving the patient that ordeal. Have cleared up old discharging ears that for time had resisted all treatment. The ordinary so-called catarrh is the great patent medicine man's hobby. As we know this trouble is not so mystic till the inflammation has passed through the mucous membrane and affected the nasal bones and sinuses, then it is the practitioner finds his arduous job as all medication is stopped by the mucous membrane and scarcely any reaches the bone and the sinuses, while this electric energy treats bone as well as the mucous membrane and thereby affect far more cures.

The surgeon as well as the practitioner will find great benefit to his patients in the rational use of violet energy in far more cases than they think when they try it out.

PROFESSOR EMIL THEODOR KOCHER,
BERNE, SWITZERLAND*

August 25, 1841 to July 27, 1917

By W. O. JOHNSON, M. D., F. A. C. S.
Louisville.

Most great men are known by their works and very little is told of their intimate personal life.

Theodor Kocher was born August 25, 1841 in Berne, Switzerland. An early account of his life is not recorded. He was raised in an atmosphere of culture. His appreciation of the best in life began early. From youth he demonstrated his studious tendencies, being a rather quiet, unassuming boy, but quite mischievous. His early training was in the grade schools, and he graduated from the University of Berne in 1865.

Following his graduation he spent some time in study, in Berlin, London, Paris and Vienna during which time he was a pupil of Langenbeck, Billroth and Luche. His associations with Billroth are said to have influenced him most of all.

From 1886 to 1872, during his study in foreign clinics, he was Associate Professor of Surgery to Professor Luche in Berne, and following Luche's death in 1874, Kocher was unanimously elected to the chair of surgery at the age of 31. This chair he occupied with supreme distinction until his death in 1917.

To be selected by his own people at such

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age was indeed an outstanding honor. But why he remained in Berne has always been a question to some. The proverbial love of the Swiss for his country explains only in part this apparent anomaly of why in such an age of intensive progression he positively refused to accept most flattering calls to extensive and remunerative fields of activity. For he found at home the most favorable and congenial surroundings to work. No where in the world were so many natural advantages combined for the free promotion of this abnormal activity than in Switzerland geographically. Not restricted by politics and unhampered by social or financial prejudice, these and many other equally conducive conditions kept him in his most loved home town.

From his earliest medical training he was a born anatomist. His first contribution to surgery that attracted attention was as a student under Billroth. He worked out a method, now known by his name, for the reduction of dislocated shoulders. A case of old subcoracoid dislocation of the shoulder was brought into the clinic and every method known to reduce the dislocation had been tried and failed. Billroth, turning to the spectators, asked if there was anyone who wished to give a suggestion. Kocher, having just perfected his method in such cases, stepped forward very eagerly and asked to be allowed to try the procedure; the shoulder was replaced at once. When asked what method and process he used he said humbly, "the Kocher method." He then described the usual position of the rent in the joint capsule, direction of movements of the head of humerus as it escaped from the joint, and the final position in which it must lie, and demonstrated why his method would succeed if duly carried out. By this (procedure) Kocher first attracted attention in surgery, and he kept before the profession from that time.

Quite early in his career he realized the truths and the vast scope of Lister's teachings, and was the first to pay strict attention to aseptic principles in open operations for carcinoma of the tongue.

As a man, Kocher was small in stature, thin, quiet, with a slow but keen appreciation of wit, an unceasing worker, inhumanly patient and kind, with an indomitable will and unconquerable tenacity, and endowed with the typical old world courtesy. In his home was always pleasant and affectionate, accepting only the truth, square and honest in all of his dealings, respected by all classes and beloved by his family.

Because of his overwhelming generosity in the care of his patients he was prone to overtax his seemingly endless strength, and it was for this reason that Mrs. Kocher directed his social and many of his professional activities.

Some of the stories of his so-called "henpecked" life are in striking contrast to the dominating personality he presented in his profession.

As a teacher he was diligent and earnest, tireless in his painstaking details. Working from 8:00 a. m. to 10:00 he taught in the theater, where the cases were brought in, examined with great care and discussed at length. He was aided in teaching by some artistic ability. Never impatient with an honest if stupid effort on the part of the student, his voice grew high pitched and querulous when students would try to deceive him by asking thoughtless questions. It was said that at times, under such conditions, his small statue would fairly vibrate with frenzy in anger with the students for jesting over some point he had taken as serious. He was a man who was never precipitate in his diagnosis of a case; he knew the value of careful and repeated observations and insisted upon absolute certainty in each individual case. Rarely was there a case that he could not explain. He implanted into his students that sense of duty which sacrifices all to the cause of the patient. He refused to distinguish between important and unimportant matters, for every detail held some importance for him and he never failed to impress this on his students.

He did not train any great men in his own school, as did Billroth, but there are surgeons all over the earth who can say that in large or small part it is with pride they claim some humble share of his great inheritance. His pupils were attracted to his clinic, not so much by the brilliancy of his teachings, as by the amount of sound knowledge they knew was to be gained from him, and the excellent training in conservative and logical reasoning which they received.

As a surgeon his life was one unceasing activity, he began teaching and operating at an early age, and throughout his career his freedom from prejudice for his own intellectual progeny was shown. His broad mindedness was shown in his early acceptance of Lister's theory, use of aseptic surgery and in his use of Bassini's operation when indicated, giving it full credit for its merits when Kocher's hernia operation had already been accepted by many. He was consecrated to his profession as his very life, and his holidays were invariably devoted to theoretical work.

There were few days in the summer or winter sessions of school when he did not visit the post mortem rooms to demonstrate an old operation or try out a new one. Throughout his whole long life his devotion to anatomy and his operative work on the cadaver were unceasing. As a result of this, every operation he did was a supreme exhibition of his

perfect anatomical knowledge, combined with a flawless, aseptic conscience, technical efficiency, and unfaltering courage, with sound unruffled judgment and the most exquisite gentleness that man could accomplish.

He was unsurpassed in his observance of details in technique, no one seeing his operations could ever forget his tender care, exquisite gentle touch, and deft light movements of every finger. Even the minutest detail was so arranged that there was no hastening, no untidiness, no shedding of one drop of blood that could be spared, no loss of time. With infinite accuracy, care, and patience he obtained results as near absolute perfection as is possible in surgery, and by such work he was able to obtain apparently impossible results in his work.

There were surgeons on the continent or abroad that could operate with much more speed but never was there one whose judgment was so sound in the performance of a daring operation where the risk of life arose. The so-called "Kocher speed" was uniform whether he performed the simplest or the most complex operation, and there is hardly a branch of modern surgery in which he has not left valuable and permanent impressions. Professor Kocher remained active until the very last, at the age of 76, shortly before he died, he lectured and operated with youthful vigor, and those who knew him had to admit that he displayed the same unbounding energy at the close of his career as he did when he started his work in the Swiss Capital. Professor Kocher not only kept pace with the progress of science and time, he was ahead.

Monihan states that Kocher lived a long life of unceasing industry and covered a wider range of subjects than any living surgeon.

His work in almost any one department of surgery alone would have made him a reputation as a surgeon of great gifts. In his resourcefulness he constantly devised methods, some entirely new, others wise, sound, true modifications of old methods. His literary work was amazing both in quantity and in high value. He published numerous works on bones, stomach, gall bladder, hernia, carnial nerves, osteomyolitis and goitre, and as his chief distinction rests in his development of operating methods for thyroid disorders, I wish here to speak of his extraordinary work in that branch of surgery.

We find from 1866 to 1872, Theodor Kocher was assistant to Professor Lucke in Berne. During that time Lucke performed ten goitre operations; of these patients, nine died. Two years after having been elected Lucke's successor, Kocher, in 1874, published his first paper on the thyroid gland on the pathology and treatment of goitre. In this paper he published his first thirteen goitre operations,

with only two deaths. He said that there were three forms of operation for goitre; total thyroidectomy, partial thyroidectomy, and enucleation. The total thyroidectomy is an easier procedure "than partial thyroidectomy, but it is a question whether there is any connection between the total extirpation of the thyroid gland and the altered mental condition I have noticed in one of my cases of total thyroidectomy." His goitre operations were done on a preconceived plan—even at that time he sought in each case to ligate the arteries first. A few years later (1887) he published his first operations for malignant goitre, describing a method of "evidement" of soft malignant tumors, especially intrathoracic ones.

In 1883 he published the results of his first 101 goitre operations. He gave at the same time a list of all the goitre operations done to date. He found that with his own 101 cases, 240 goitre operations had been performed. In this same paper he detailed his exact method of operating, and then described the consequence of total thyroidectomy. He had reviewed all the cases he had operated on, and in the eighteen cases where total thyroidectomy had been done he found the typical picture of myxoedema. In April, 1883, he read a paper on the consequence of total thyroidectomy at the German Surgical Congress, calling the disease "cachexia thyreopriva." From that moment he began to treat these cases of total thyroidectomy by making transplantation of pieces of thyroid gland or goitre in many different parts of the human body, skin, muscle, arteries, peritoneum, intestine, etc., but the effect was only temporary. Later on he reviewed these cases as often as possible; he found that those cases in which a real total thyroidectomy had been performed, died within seven years after the operation (no thyroid tissue could be found at the post-mortem examination), while those who lived longer had developed a new but small goitre, proving that total thyroidectomy had not been done.

In the years from 1880 to 1890 he studied the question of the etiology of goitre, examining thousands of school children all over the canton of Berne, and examining especially the water at the different places. In 1889 he published a map showing a close connection between geological formation and the distribution of goitre. At that time, in a public lecture, he urged the Government to boil the drinking water in the public schools, or to add iodine to it, in order to prevent goitre.

In 1889 he published the results of another 250 goitre operations. In this paper he described his exact procedure in the operation he named "enucleation resection," including the collar incision of the skin. This method

of operation for goitre was that used by him in all his goitre operations without any modification; it became and remains today the classical method of operation for nodular goitres all over the world. This method not only included the collar incision of the skin now universally used, but also gave the exact method of leaving all healthy thyroid tissue behind, so assuring a sufficient function of the thyroid to prevent myxoedema, and avoiding any lesion of the recurrent nerve and of the parathyroid glands, which became known only later on. Hotz calls it the bilateral Kocher operation.

In 1887, when showing a case of Grave's disease to his students to illustrate a clinical lecture, he demonstrated the hypervascularization of the thyroid gland, and suggested that the symptoms of the disease were due to hyperthyroidism. He was the first to perform a successful operation for goitre in a typical case of Grave's disease. In 1897 he published sixty-nine cases of Grave's disease operated upon, with only four deaths.

In 1892 Theodor Kocher published his paper on the origin and prevention of cretinism, in which he described a case of congenital goitre with cretinism, and showed that cretinism was due to lack of thyroid function, and can be prevented by the same measures as those by which goitre can be prevented. This point of view for long met with much opposition but has nowadays been generally accepted.

In 1895 Theodor Kocher had done 1,000 goitre operations; in 1901, 2,000; and in 1905, 3,000. At the time of his death in 1917 he had personally performed 6,000 goitre operations.

In 1897 he read a paper on the action of iodine on goitres. In that paper he suggested that the normal thyroid gland must contain iodine, as the action of desiccated thyroid gland on goitres was the same as that of iodine. Unfortunately, the professor of chemistry at the University of Berne, who made the investigation, could not find any iodine in the thyroid glands he examined. A year later Bauman in Freiburg published his article on the normal iodine content of the thyroid gland.

In 1907 he read the opening paper at the German Congress of Internist at Munich, on the pathology of the thyroid gland, and in 1906 gave the annual oration (on the same subject) before the Medical Society of London (British Medical Journal, 1906, vol. i, p. 1261). This work was the starting point of modern endocrinology, nothing important has been added to it since. In 1907 he published also an important paper on malignant goitre, describing the different forms in conjunction with Langhaus.

In 1908 he described his methods of gland grafting, publishing seventy-nine cases of transplantation in myxoedema, mongolism, and hypothyroidism. He especially recommended taking the transplant from a gland of a case of exophthalmic goitre, thus proving by his successful cases that the gland in Grave's disease is hyperactive and not toxic. In the same year he published the exact analysis of the blood in 260 cases of Grave's disease, showing that the leucocyte formula displayed a typical change, and a few years later he also showed a typical blood change in myxoedema, pointing out that the number of the lymphocytes in the blood was connected with the functional change of the thyroid gland. This close connection of the lymphocytes and lymphoid tissue to the secretion of the thyroid gland has recently been established histologically by Williamson.

In 1910 Theodor Kocher gave the classical picture of Iodbasedow, showing that the use of iodine can produce Grave's disease in certain forms of goitres, and drawing attention to the harm that can be done in consequence by the use of iodine in goitres. Though at the present the Mayo school has shown that Lugol's solution can, in certain cases of Grave's disease, bring about an improvement and make the operation less dangerous, Kocher's observations and statements remain quite true. The exact role of iodine in the disease is, however, far from being explained.

In 1909 he was awarded the Nobel prize for his research work, and especially for his discovery of the function of the thyroid gland. He then gave before the Academy of Medicine of Stockholm an address in which he drew a classical picture of the minor functional troubles of the thyroid gland, hypo- and hyper-thyroidism.

In 1911 Kocher published the results of 1,200 operations on the thyroid gland in Grave's disease, with 80 per cent complete cures. In that paper he showed how the disease can be diagnosed in an early stage, and advocated early operation. He described a new lid symptom which appears very early, namely, the contraction of the levator palpebrae superioris when the patient is made to look up and down quickly.

At the meeting of the Swiss Surgical Congress in 1917, a few months before his sudden death, Theodor Kocher reviewed all his goitre operations from which it appeared that he had had, at that time, a mortality of 2 per mille in operations of ordinary goitre, and 2 per cent, in Grave's disease. At the time he gave a summary of our knowledge of the etiology of goitre, recommending the prophylactic treatment.

It is worth while to recall all that has been done for the advance of our knowledge about

the thyroid gland by Kocher, and under his guidance by his people. It is noteworthy that Kocher never made any fantastic statements, but only drew those conclusions he could really prove, giving entire credit to all that others have contributed to the question. Since his death comparatively little work has been done on the subject, but very many theories have been advanced.

Following in the advancement of the thyroid operations to what they are today are Halsted, Crile, Mayo, Layhe, Crotti, all of which have made valuable contribution in management and operative technique of operation for goitre patients. But Kocher's work was the foreword of them all.

When we try to measure the greatness of a man we are confronted with the selection of standards of comparison to determine the chief legacy a surgeon bears. Personal reputation, however exalted is soon forgotten, and the name of a distinguished surgeon may not be long remembered in his own country.

Books and writings, which at the time of their appearance are striking in the new thought or in the fresh presentation of old ideas, cease soon to be real, new publications bring changes in thought. Likewise, spoken words easily slip the memory and characteristic sayings soon lose their authorship.

So we believe that the chief legacy a surgeon can bequeath is a gift of the spirit. To inspire his many survivors with a firm belief in the high destiny of our calling and with a confident and unwavering intention both to search out the results of medicine in her inner most recesses and to practice the knowledge so acquired with sincere purpose, high ideals and generous heart, for the benefit of humanity, that is the best that a man can convey.

I believe that those who were fortunate enough to know Kocher will agree that he uplifted in every way the spirit of his profession. We can truly say that in the death of Kocher, on July 27th, 1917, one of the outstanding modern masters of surgery has been removed. It is pleasant to note that in his own native town, so dear to him, his genius was so early and long recognized.

SOME OF HIS PIONEER ACCOMPLISHMENTS

- (1) Field of abdominal surgery, first in Switzerland to do oophorotomy.
- (2) First to apply aseptic technique to tongue operations.
- (3) Original work on gun shot wounds.
- (4) Pioneer surgeon in aseptic operations for bones, hernia, thyroid, etc.
- (5) First surgeon to do 5000 Thyroidectomies.
- (6) First president of the International Surgical Association.
- (7) Awarded Noble prize in 1910.

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THE GASTROINTESTINAL HISTORY*

By WALTER E. VEST, A. B., M. D., F. A. C. P.
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When my friend and comrade in arms, your secretary, invited me to present a paper before your society I began to cast about for a suitable subject. For some years past, about sixty per cent of my patients have given as their chief complaint some symptom referable to the gastrointestinal tract, usually the reply being "indigestion," or "stomach trouble." In studying these cases the conclusion has been driven home that the stomach is what might be termed the barometer of the human anatomy, so readily does it show a response to all sorts of stimuli in almost any part of the body, for approximately eighty per cent of such cases have extragastric pathology as the cause of their symptoms and about one-fourth of the whole number show the cause entirely without the gastrointestinal tract. Moreover, it has for a long time seemed to me that, as the development of means and instruments of precision has gone on, there has been a great tendency among our profession to lean too strongly on these mechanical aids and too little upon our clinical judgment to the neglect of our history taking and physical examinations. In other words, we are neglecting our God-given diagnostic apparatus for man-made substitutes to the detriment of not only our patients but to our own professional development as well. Accordingly, at the risk of appearing commonplace, I chose the subject listed on your program, not expecting to present anything new, or in fact, anything with which each of you is not now familiar, but hoping by reiteration to impress the value of symptoms in diagnosing digestive complaints.

In any diagnostic problem presented for solution, one of the prime requisites is a good history. This is especially true when the patient complains of indigestion for nowhere in the whole realm of medicine is an accurate painstaking history more of a necessity. In discussing this subject we shall consider briefly certain general points which may influence our conclusion and more at length the symptoms most often complained of and their probable significance. The latter may be divided into two classes; the general, or those referring to parts of the body other than the

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abdomen; and the local, or those referring definitely to the abdomen.

Under general considerations should be recorded age, sex, occupation, residence, history of past illnesses, injuries and operations, habits, and the constancy and duration of the indigestion. Age and sex may suggest gall stones for who does not remember the oft-quoted alliteration of the five f's; "fair, fat, forty, female, flatus?" The occupation may shed light on the true cause of abdominal symptoms for it would be an unpardonable blunder to do a laparotomy for lead colic. Past residence in the South should lead us to think of intestinal parasites, amebiasis, malaria, pellagra or sprue. The history of a malaria may be of value and that of typhoid or an initial lesion may be especially significant and a past operation may mean adhesions. Habits should be gone into very thoroughly especially regularity, the chewing habit, varieties of food, water drinking, food intolerance, and the use of coffee, condiments, tobacco and alcohol. Seasonal variation is very suggestive of ulcer, and the duration of the symptoms may be of special value in differentiating between ulcer and cancer in patients past the meridian of life.

Of the general symptoms, the first we shall take up is headache, which is probably most often associated with constipation. However, the eye condition should always be inquired about because there is a headache-digestive syndrome dependent upon eye strain, which clears up after the patient has become adjusted to proper lenses. Moreover, there is a type of headache, usually frontal and often unilateral, due to food intolerance. Nausea is frequently an accompaniment, and both symptoms are promptly relieved by vomiting the offending material or by gastric lavage. Constipation accentuates this type markedly. The "bilious headaches" are usually associated with a chronic cholecystitis or a focal infection elsewhere in the body. It is probable that typical migraine is most often dependent upon a chronic gall bladder, or at least some biliary derangement. Somewhere in the literature I recently saw the statement that headache following the ingestion of alcohol depends upon liver insufficiency.

Many of these digestive unfortunates complain of cardiac palpitation and are obsessed of the idea that they are victims of organic heart disease. This is usually seen in persons of the ptotic type, the so-called habitus enteroptosis, and usually an actual gastropptosis is noted. The eructation of gas, which is commonly present in these cases, affords a measure of relief. Care must be taken to exclude myocardial disease because indigestion may be an early sign of a failing heart muscle in which instance there is usually

present a moderate enlargement of the liver.

Vertigo may be complained of and is usually associated with constipation, being really a result of intestinal autotoxemia. When present careful aural, neurological and blood examinations are necessary: for dizziness may mean a diseased labyrinth, cerebrospinal pathology, or pernicious anemia.

Various skin manifestations may be dependent upon gastrointestinal dyscrasia. Jaundice should always be inquired about and especially should its recurrence be noted. Accompanying pain is very significant of gall stones, and a preceding attack of colic suggests common duct obstruction. Chloasma, or liver spots, are usually dependent upon prolonged constipation associated with hepatic insufficiency. Urticaria, now generally believed to be an anaphylactic phenomenon, is most often a matter of food toxemia. Itching may be urticarial in origin, or it may mean either a high blood sugar level, or jaundice. Eczema is often a food sensitization and is commonly accentuated by constipation. The rash of pellagra is usually unmistakable. A prolonged sore mouth suggests pernicious anemia, sprue or pellagra.

Certain respiratory symptoms should always be inquired about. These are cough, expectoration, post-nasal drip, liability to colds and recurrent sore throats. Not infrequently is indigestion the chief complaint in incipient pulmonary tuberculosis and every now and then gastrointestinal symptoms are dependent upon a focus of infection in the upper respiratory tract, especially chronic tonsils. The dental history may be of value, certainly as to pyorrhea.

Weight loss, pallor and weakness should be considered together. They depend upon lack of assimilation and anemia, and may mean ulcer, cancer, tuberculosis, pernicious anemia, pellagra, or sprue.

Certain urinary symptoms may be of importance for fairly often gastrointestinal symptoms are indicative of renal pathology; hence we should always inquire about frequency, oliguria, burning, dribbling, incontinence and hematuria. Polyuria suggests diabetes. Urine of a dark amber color may precede jaundice and when this is the case gives a positive bile test.

Of the local symptoms, the first we shall consider is pain, which is usually described, dependent upon location, as epigastric, umbilical, or right or left upper or lower quadrant as the case may be. The character, constancy and duration should be noted; and especially the radiations. The upper abdomen has been called the area of abdominal romance and this description applies very aptly to pain in this region. Epigastric pain may be due to cancer, either gastric or pan-

creatic, ulcer, pylorospasm, gall stones, radiation of angina, aneurysm, tabes, syphilis, epigastric hernia, vertebral disease, or pancreatitis. The pain of cancer is often boring, is usually more or less constant and may be only a late development. That of ulcer is usually seasonal, comes on at a definite interval after the ingestion of food, and may be most marked at night. Ordinarily it is relieved by taking food or alkalis. Gall stone pain is more likely to be in the right upper quadrant just beneath the costal margin and usually radiates backward to the scapula, less often to the right shoulder, or up to the right side of the neck. Moreover, it is at times induced by certain foods, and is colicky and often very severe. Angina pectoris radiates to the left shoulder and arm but may be limited to the upper abdomen. It is usually very severe, fleeting, and accompanied by a sensation of impending death. The next day there may be a chest soreness or a sensation of heaviness in the left arm. Violent sudden upper abdominal pain accompanied by shock may result from a perforated ulcer or an acute pancreatitis. Careful chest examination should always be done in acute upper abdominal pain as a pneumonia or a diaphragmatic pleurisy may be the cause. In the right upper quadrant, pain may signify cancer of the liver, gall stones, acute cholecystitis, peptic ulcer or renal stone or block. Pain due to renal conditions, especially stone, usually radiates downward to the penis or testicle in the male, and to the vulvae in the female. In the left upper quadrant it may be renal, splenic, or colonic in origin. Pain in the region of the umbilicus is most often due to hernia of that organ or to appendicitis. It may be due to torsion of the omentum, or to mesenteric thrombosis. Right lower quadrant pain may result from appendicitis, caecal, ureteral or pelvic disease. The same is true of the opposite quadrant, appendicitis excepted. Hemorrhoids may at times give pain in the lower quadrants and are very likely to be an accompaniment of gall stones. Cancer, diverticulitis, obstruction and tuberculosis may cause pain anywhere in the abdomen, dependent upon location. Diverticulitis, however, is probably most often left-sided. Tabes likewise is no respecter of localities. Beginning ischio-rectal abscess, acute non-specific prostatitis and acute epididymitis may simulate very closely acute appendicitis. Food allergy may give marked pain with many of the accompanying phenomena of an acute surgical abdomen, and at times the injection of a prophylactic dose of typhoid vaccine presents the same picture. During the World War the writer saw a few such reactions, apparently allergic, resembling very closely acute appendicitis. In these a leu-

cocytosis was present. Pain, tenderness, nausea and vomiting may be early symptoms of acute nephritis, and in such cases oliguria is an accompaniment.

Discomfort, or distress, is only pain in a mild form, and is to be looked upon similarly. Heartburn is usually indicative of an excessive acidity and is commonly present in ulcer. It usually comes on when the stomach is empty and is relieved by taking food or alkalia.

Nausea and vomiting should be considered together. When present they may mean almost anything and should be evaluated in the light of the remainder of the clinical picture. The character of the vomitus may be very significant, however. Hematemesis is most often significant of ulcer or cancer, but may direct attention to the liver. Remnants of food eaten more than six hours prior to vomiting usually spells gastric stasis and is most often seen in pyloric stricture due to ulcer or cancer. It may be present, however, in the atony of ptosis. Fecal material in the ejecta denotes obstruction, and excessively sour material ulcer, or at least hyperchlorhydria. When vomiting without nausea is present, brain tumor should be excluded, and projectile vomiting is especially significant of this condition but ordinarily when a brain tumor has progressed to the stage, the picture is so plain that "he who runs may read." When pain and nausea are both present, priority in onset should be determined for when pain precedes nausea the cause is much more likely to be surgical than when the reverse is true. Otherwise unexplained nausea and vomiting may rarely be due to thyroid dysfunction.

Dysphagia may mean esophageal stricture, either benign or malignant, or cardiospasm. In the latter condition, Smithies has emphasized the fact that solids are swallowed more readily than liquids. The history of swallowing a corrosive years before is very suggestive of a stricture. Gaseous distension may be due to dietetic indiscretions, chronic cholecystitis, gall stones, hypochlorhydria, ptosis, constipation and gradually oncoming obstruction. Likewise it may occur in acute infectious diseases, notably typhoid and pneumonia. Eructations are usually present in gaseous distention. Food may also be eructated, and when such is the case, may mean a variation from the normal acid content. If this is high, the eructated material is sour and usually sets the teeth on edge. Explosive escape of gas from the stomach is most often a symptom of aerophagia and there are ordinarily other neurotic manifestations present.

The appetite should always be inquired about, but its significance is variable, and, at best it should be considered only suggestive.

Loss of appetite is especially likely to be noted in early tuberculosis, gastric cancer, pernicious anemia, sprue and pellagra. The statement has been made that distaste for meat may be an early symptom of gastric carcinoma, but personally I have never seen such a case. Variable appetite is common in neurasthenia and ptosis. Ravenous appetite may be habitual or it may signify diabetes or intestinal parasites, usually tape worm. There is a variety of intermittent ravenous appetite associated with "bilious attacks" and preceding such attacks. Whether this phenomenon is a preliminary symptom or an exciting cause of the succeeding upset is questionable.

Diarrhea, constipation and the characteristics of the stools we consider together as they all have to do with variations from the normal evacuation. The duration of a diarrhea is very significant. This symptom, when acute, often means only an error in diet, but it may usher in typhoid or dysentery. Prolonged morning diarrhea probably means sprue. The chronic type of diarrhea may be due to achlorhydria and is usually a symptom of pernicious anemia, and it sometimes is seen in pancreatic hypofunction. In these conditions it is likely to be more prevalent in the afternoon and evening. Alternating constipation and diarrhea suggests early tumor or an accumulation of a dense mass of faecal material in the intestine. It may be present in mucous colitis and in chronic colitis generally. Any prolonged diarrhea may be due to infection with *ameba coli* or *cercomonas hominis*, and stool examination is always indicated in suspected cases. Also, in a prolonged diarrhea, hyperthyroidism is to be thought of.

In an acute febrile disease, blood in the stool signifies either typhoid or dysentery. In the former, the bleeding is more likely to be intermittent, or possibly limited to one large hemorrhage, while in dysentery blood is usually present in each stool, a large admixture of mucus is noted, and the passage of stools is frequent and is usually attended by violent griping pain. In tarry stools the blood originates high up in the digestive tract, but bright red blood comes from the rectum or anus and is far more often due to hemorrhoids than to any other cause. A marked amount of mucus usually is due to mucous colitis, especially if the mucus is in strands or casts. It is usually the latter type which show such marked nervous symptoms. Most often these patients are constipated; rarely there may be brief diarrheal periods alternating; and the act of defecation is usually immediately preceded or accompanied by griping pain. Dense scybalous stools are found in certain types of constipation, especially that due to over-absorption from the

colon. The well-known clay-colored stool is seen when there is not proper excretion of bile. Undigested particles of food may mean over-eating, insufficient chewing, achylia or pancreatic hypofunction, and may be noted in pernicious anemia, pellagra or sprue. Grayish, mushy, foamy stools are characteristic of the latter condition and are evacuated during a period of morning diarrhea, numbering usually seven or eight passages. Constipation may be present in many conditions ranging from improper habits and intestinal atony to cancer. It is unquestionably one of the physical sin of our modern life. We use the term sin because it is so often dependent upon carelessness in habit and in these cases so readily overcome by constant attention to the detail of correct hygienic living. It may be associated with hyperchlorhydria, or any chronic inflammatory or obstructive lesion. Coming on gradually late in life, it is very suggestive of malignancy. We once saw a case of constipation in which the act of defecation was accompanied by nausea and usually by vomiting. The only pathology made out was a small diverticulum of the sigmoid. Operation was declined, and the patient has been lost sight of. Constipation is such a commonplace, that it is likely to be regarded too lightly and we feel that, when present, careful gastroenterological examination is indicated.

In discussing the symptoms to be considered in a gastrointestinal history, we would not deery the physical, laboratory, and roentgenological examinations. On the contrary, we would urge them as well. But we do feel that there is too much of a tendency to shift the burden of diagnosis upon the laboratory and the x-ray, "shortcuts to diagnosis" and this tendency is certainly to be deprecated. These aids are very valuable but are limited. Too many physicians do not have access to them; but everybody can take a history and with a little effort, a good one. Only a moderate amount of time and a little trouble are necessary. Moreover, a very large percentage of people who consult a physician do so because of gastroenterological symptoms. It behooves each of us, therefore, to get at least a good history on all such presenting themselves.

Hydatid Cyst of Gluteal Region.—Cabrera Calderin asserts that the localization of an hydatid cyst in the gluteal region is a very rare occurrence and that his case is the first to be reported in Cuba, and the third in the literature. The patient, aged 25, complained of continuous and intense pain in the left hip, radiating to the thigh. A tumor was found in the left gluteal region, and after two exploratory punctures, a diagnosis of hydatid cyst was made. The tumor was incised. A transparent fluid, then pus, was evacuated.

SERUM TREATMENT OF SCARLET FEVER*

By JAMES H. PRITCHETT, F. L. FLETCHER
Louisville.

In an attempt to learn of what value specific serum had been to us in the treatment of scarlet fever, and because of our belief that only through a study of results of treatment in a large number of cases, in the hands of many men, over a considerable period of time, can any unanimity of opinion on the value of serum treatment be reached, these cases were studied.

The cases analyzed were a part of those admitted to the contagious wards of the Louisville City Hospital between July, 1924 and March, 1929. Cases in which the diagnosis was doubtful or which were complicated by some other disease unrelated to scarlet fever were not included. During different periods, all cases of scarlet fever admitted were treated with antitoxin on admission, during other periods, no serum was given regardless of the severity of the case. Only commercial sera were used and for the most part only one therapeutic dose was given, that intramuscularly, but in the most severe cases, during the periods when antitoxin was being given, two or three therapeutic doses were administered into the muscles.

One hundred and thirty-eight cases were admitted which could be satisfactorily analyzed. Of these, sixty-six received scarlet fever antitoxin, and seventy-two did not. Ninety-seven of the hundred and thirty-eight patients were admitted within four days of the appearance of the first symptoms, eleven on the first day, twenty-eight on the second day, forty on the third day and eighteen on the fourth day. This, in most of the cases, was within seventy-two hours of the appearance of the rash. Most of the cases were not previously seen by a physician except to order them to the hospital. None had antitoxin previous to admission and very few had any treatment before coming to the hospital. This however, did not seem to have any effect on the subsequent development of complications, for with one exception, the complications developed in patients admitted within four days after the onset of the disease.

SERUM REACTIONS

Of the sixty-six patients treated with antitoxin, thirteen, or nineteen per cent had reactions consisting of urticaria, fever and malaise. If all cases having arthritis, general adenitis or unexplained fever are included as serum sickness, thirty-two had this condition. Since arthritis, general adenitis and unexplained fever occur in non-serum treated cases however, and there was no urticaria, these conditions may be classed either as complica-

tions of scarlet fever or as manifestations of serum sickness.

Total	138 cases
Serum	66 cases
No serum.....	72 cases
Serum reactions.....	13 cases—19%

Complications	Serum Given	No serum Given
Otitis Media.....	5 cases	6 cases
Arthritis	3 cases	0 cases
Unexplained Fever	3 cases	2 cases
Sinusitis	2 cases	1 cases
General Adenitis.....	2 cases	1 cases
Nephritis	2 cases	0 cases
Recurrence of symptoms	1 cases	2 cases
Peritonsillar Abscess.....	1 cases	0 cases
Total.....	19 (28%)	12 (16%)
Deducting arthritis, general adenitis and unexplained fever	11 (16%)	
Deaths.....	2 (3%)	2 (2.5%)

TEMPERATURE CURVE

Of the serum treated cases, forty-eight or seventy-two percent had a normal temperature within five days after admission. Of the non-serum treated cases, fifty-six or seventy-seven per cent had a normal temperature within the same period.

COMPLICATIONS

The percentage of complications in the serum treated cases varies, as does the percentage of serum reactions, depending upon whether all cases of arthritis, general adenitis and unexplained fever are interpreted as serum sickness or as complications of scarlet fever. The same argument holds true, namely, that as the conditions also occur in non-serum treated cases, not all of them are due to the use of serum. The percentage is either twenty-eight per cent complications or sixteen per cent, depending upon the interpretation. The percentage of complications in the non-serum treated cases was sixteen.

The commonest complication in both groups was otitis media, this occurring in seven per cent of the patients of each. In none of these cases was mastoidectomy necessary. Three cases of the serum treated group and two of those not receiving serum had fever of a moderate degree lasting more than twenty-four hours for which no cause could be found. Three of the sixty-six serum treated cases had arthritis and none of the non-serum treated cases. Two cases treated with serum developed sinusitis, one of those not receiving serum. All cleared up under conservative treatment. There were two cases of general adenitis in those treated with serum, one in those not so treated. In no case was operative intervention necessary. One serum treated case had a recurrence of symptoms with re-appearance of the rash, fever and pharyngitis, after the original symptoms had subsided. This occurred in two cases not receiving serum, one of whom had only a re-appearance of the

*From the Department of Pediatrics, University of Louisville.

rash. One serum treated case developed a peritonsillar abscess which was incised and drained. Two cases, one admitted on the second day of the disease and the other on the third, both of whom were treated with antitoxin, developed nephritis. None of the non-serum treated cases in this group had this complication, but two not included, neither of whom had had serum, were seen during the past year. Both of these were ambulatory except for three and four days during the height of the disease, and walked into the hospital five and six weeks after having had scarlet fever. How much this affected the development of the nephritis can only be guessed at, however.

MORTALITY

Two cases died in each group, a mortality of three per cent in those serum treated, and two and one-half per cent in those not so treated. Of those receiving serum, one had chronic nephritis on admission and died on the third day in the hospital; the other had a very severe angina and died four days after admission. Of the non-serum treated cases dying, one had a severe broncho-pneumonia on admission and died on the third day after admission, and on the seventh day of the disease. The other patient had a severe angina and vomited persistently; she died five days after admission very suddenly while ten per cent intravenous glucose was being administered. She had been sick with symptoms of scarlet fever for eight days, i. e., three days before admission; and while her death was attributed to cardiac failure, no autopsy was permitted.

PERIOD OF QUARANTINE

No consistent policy was followed in the matter of quarantine, so no conclusions can be drawn. All cases were discharged twenty-eight days after admission, twenty-eight days after the onset of the disease, or before that with the knowledge of the Board of Health. During the past eight months we have used practically no antitoxin and so far we have not had a second case from a home to which we have returned a patient twenty-eight days after the onset of the disease.

COMMENT

While mortality figures from a group of only one hundred and thirtyeight patients can hardly be used to draw conclusions, they are so nearly like those of Toomey and Dolch (1) that some significance may be attached to them.

The contention that the use of specific serum brings the temperature back to normal within a shorter period is not borne out by this study. We paid little attention to the time at which exanthema faded, believing that the temperature curve and the patient's statement as to his condition were more important.

Statements as to the effect of serum on the development of complications vary, but they were not reduced in this series of cases, however the figures may be interpreted. Without question, a severe serum reaction causes the patient much more discomfort than a mild case of scarlet fever, and serum apparently does not tend to reduce the number of complications. As yet we have no means of shortening the regular twenty-eight day period of quarantine with the use of antitoxin, and we have been unable to observe any lessening in the number of cases of scarlet fever contracted from patients who have been released after the regular quarantine period and have been treated with scarlet fever antitoxin.

(1) Toomey, J. A. and Dolch, E. G. Scarlet fever: The Use of Scarlet Fever Antitoxins, *Am. J. Diseases of Children*, vol. 36, p. 1179, December, 1928.

BOOK REVIEWS

PHYSICAL THERAPEUTIC TECHNIC. By F. B. Granger, M. D. Late Physician-in-Chief, Department of Physical Therapeutics, Boston City Hospital; Director of Physiotherapy, United States Army; Medical Counselor, United States Veterans Bureau; Member of Council on Physical Therapy, American Medical Association; Instructor of Physical Therapeutics, Harvard Medical School; Assistant Professor of Physical Therapy, Tufts Medical School. With a Foreword by William D. McFee, M. D., Boston Mass. Octavo volume of 417 pages with 135 illustrations. Philadelphia and London: W. B. Saunders Company, 1929. Cloth \$6.50 net.

This valuable book is intended for the physician, who has installed a limited equipment of whom the Council on Physical Therapy of the A. M. A. said: A physician, who has installed a diathermy machine or an ultra violet-ray generator, can do good in carefully selected cases with one of these methods. He is not, however, fully equipped to render physical therapeutics. As a rule, it is the careful combination of several physical agencies that gets results.

The book is well written and abundantly illustrated and is the result of the personal experience of the author, covering a period of twenty-five years.

A DOCTOR'S LETTERS TO EXPECTANT PARENTS. By Frank H. Richardson, M. D., F. A. C. P. Children, The Parents Magazine and W. W. Norton and Company, Inc., New York, Publishers, Price \$1.75.

Three things that Make this book Distinctive:

1. Much has been written on the physical problems of the mother-to-be. This book deals with the psychological aspects as well.

2. Fatherhood has generally been thought of as commencing with the baby's birth. But the father's job begins long before. This book is for both expectant mothers and fathers.

3. The second and third child present prenatal problems as well as the first. Many irreparable consequences are caused by lack of care. This book helps you to avoid them.

The letters, eighteen in number, are informal and intimate, and at the same time scientific and exceptionally helpful.

ANGINA PECTORIS. By Harlow Brooks, M. D., Professor of Clinical Medicine, New York University, and Consultant Physician to New York's largest hospitals. 176 pages. Price \$2.50. Harper & Brothers, Publishers, New York City.

The second volume of the Harper medical books entitled "Angina Pectoris" has been written by Harlow Brooks, M. D.

Angina Pectoris is likely to receive too little attention from the practising physician, or it is accepted as a fatal syndrome. The author has discussed the etiology, so far as it is known at the present time and has given careful consideration to the pathology, and pathologic physiology as developed from his observations. Symptomatology, including obscure types of the syndrome, differential diagnosis, especially between true and false angina, and detailed treatment are presented clearly and comprehensively.

Dr. Brooks assumes a new outlook for angina patients or those predisposed to it by reason of heredity or other etiological factors. He advances the idea that angina may not be fatal or that if treated in its early stages, the result may be regarded as an effective cure. It is possible, writes this authority, to so regulate the lives of those predisposed to this condition, that they may escape it.

The author of this volume writes from personal experience in New York's largest hospitals. The book is not a review of the literature already published, but is a thorough study of the subject from the consulting physicians's viewpoint. Dr. Brooks lays particular stress on the treatments which should be given in these cases and under certain conditions.

These new publications in the Harper Medical Monographs are attractively priced, compact in form and authoritative, designed to give the general practitioner a complete and up-to-date library on individual diseases, methods of treatment, etc. The advisory editorial board for this series includes a group of eminent authorities in the medical profession. This series should be of great value to physicians who now find it difficult to keep abreast of the latest developments because of

the size and complexity of the literature, and the expensiveness and bulk of the average medical book.

ADVISING THE TUBERCULOUS ABOUT EMPLOYMENT. By W. I. Hamilton, Contributing Editor of Occupational Therapy and Rehabilitation and T. B. Kidner, President, the American Occupational Therapy Association. A book for the doctor, the nurse, the public health officer, and the patient. Price \$2.00. The Williams & Wilkins Company, Publishers of Scientific Books and Periodicals, Baltimore, Md., U. S. A.

This book has developed out of many years of work in personnel and rehabilitation. Much of the thought has been presented in one form or another to other workers in these fields, and has had the benefit of their criticisms and suggestions. Parts were used with groups of professional students at the Harvard Summer Schools of 1921 and 1922.

While acting as Industrial Research Secretary for the National Tuberculosis Association, Mr. Hamilton prepared a bulletin on employment for the tuberculous for the joint use of the United States Veterans' Bureau and Federal Board for Vocational Education, and mimeographed copies were supplied to field workers. Having served its purpose in that form, the editor of the *The Journal of the Out Door Life*, encouraged the preparation of a series of articles for that publication based on the government document. The officials of the Federal agencies concerned courteously gave permission to make such use of the material as was desired and the articles were published.

It is a sane statement of the problem of the reinstatement of the tuberculous in industry, and a recommendation of methods and procedure accredited by modern practice.

YOUTHFUL OLD AGE, HOW TO KEEP YOUNG. By Walter M. Gallichan, with Introduction by Thruman B. Rice, A. M., M. D., Associate Professor of Bacteriology and Public Health, Indiana University School of Medicine. The MacMillan Company, Publishers, 60 Fifth Avenue, New York City. Price \$2.50.

To those who chafe under the "fads" and "isms" propounded by health cranks, this book will come as a welcome relief.

Keeping young is an art, and the author of this book, a hale and hearty sexagenarian, tells from his personal experience how it is accomplished through common sense observance of the simple rules of hygiene while *enjoying life*.

Life as Gallichan sets it forth is a "sweet potion of labor and laughter and love."

WOMAN'S AUXILIARY NOTES

Mrs. D. A. Bates, the president of the Woman's Auxiliary of the Jefferson County Medical Society, has appointed Mrs. G. A. Hendon chairman of the Entertainment Committee for the annual meeting of the association to be held in Louisville, October 21, 22, 23, 24, 1929.

This appointment gives renewed pleasure and interest in the meeting as Mrs. Hendon is planning many entertainments and the ladies will have every day some special feature of interest.

KENTUCKY HONORED

Mrs. Irvin Abell, of Louisville, was elected Fourth Vice President of the Woman's Auxiliary of the American Medical Association at the recent meeting in Portland.

Mrs. Abell has been an active member in her own county and state organization and was treasurer for the national organization, and Kentucky is honored in having such an enthusiastic worker as Mrs. Abell elected to this national office.

Mrs. A. T. McCormack was elected Recording Secretary of the Auxiliary of the American Medical Association at the Portland meeting.

CUMBERLAND VALLEY

At the recent meeting of the Cumberland Valley Medical Society, held at Clear Springs, Bell County, Mrs. F. T. Fort, of Louisville, was the guest of honor of the auxiliary. Many of the ladies were present and enjoyed the dinner and the cool mountain breezes, the lovely mountain laurel and the opportunity to greet new friends and meet old ones. Members from Whitley, Bell, Knox, Harlan were present. The meeting was held in the auditorium and after the meeting, a hike was made through the mountains.

News Items

Mrs. A. T. McCormack is spending the summer at Berlin, New Hampshire, and her friends will be interested to know that she has recovered from the recent automobile accident.

Reports are coming in that many of the societies are very active in securing subscriptions to *Hygiea*. In no season of year is this magazine of more value to the laity than the summer months. Its wealth of knowledge concerning children, should be accessible to every mother and the Woman's Auxiliary in all our counties can help bring this magazine to the home.

Those who have not paid their dues to the secretary of their local society, plan to do so before the annual meeting, so that you will receive the program and the annual number of the *Journal*, which will contain the full report and all the activities of the society.

Mrs. P. E. Blackerby, President-elect, has made an extended tour to the Eastern part of the State, visiting Whitley, Bell and Harlan counties.

Members of the Auxiliary are invited to play in the golf tournament at the Louisville Country Club anytime between Saturday, October 19th through to Thursday, October 24th. A prize will be given to all the flights. Any club is just as welcome as a Glenna Collett and every member is urged to play.

Louisville during the annual meeting offers many attractions for the visiting ladies. The Brown Stock Company gives all the Broadway successes and changes the plays every week and reserve seat costs only one dollar.

Fall shopping will be in full swing and several merchants will have special showing for the Auxiliary.

The Art Exhibit at the Speed museum will be open besides other places of interest. Come to Louisville.

The Laboratories of the State Board of Health has now for distribution a limited supply of bacteriophage for the treatment of staphylococcus infections.

Dr. Gladys Dick, Chicago, spent Friday and Saturday, July 26th and 27th, at Clay, assisting and supervising the work for scarlet fever eradication in that community. Dr. Jones, the State Epidemiologist, has had charge of the work.

NEWS ITEMS

Dr. Leon L. Solomon announces the opening of offices in Breslin Medical Arts Building; Third and Broadway, Louisville. Hours 9-12 and 3-4. Telephone: City 675.

Dr. J. Kenneth Hutcherson announces the removal of his office to Suite 444 to 452 Francis Building, after June 1, 1929, Louisville. Office hours 12 to 2 p. m. and 4 to 5 p. m., and by appointment. Telephone: City 2328.

Dr. Wm. Barnett Owen and Dr. Robert Lee Woodard announce the partnership in Orthopedic Surgery, 822 Heyburn Building, Louisville.

Dr. Arthur Clayton McCarty announces the removal of his offices on July 1st to Suite 810 Heyburn Building, Louisville.

Drs. F. T. Fort, W. A. Jenkins and T. Cook Smith, of Louisville, attended the meeting of Cumberland Valley Medical Society, held at Clear Springs, Bell County.

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COUNTY SOCIETY REPORTS

Monroe: The Monroe County Medical Society met Wednesday, April 10th, 1929, at the office of the Monroe County Health Department.

Those present were: R. F. Crabtree, J. T. Smith, Geo. E. Bushong, J. W. Bowman, R. F. Duncan, Geo. W. Bushong, H. B. Ray, Earl Bryant, J. F. Marrs.

R. F. Crabtree was elected President by unanimous vote of those present.

Geo. E. Bushong was elected Secretary-Treasurer by unanimous vote of those present.

J. T. Smith was elected by acclamation as delegate to the State Medical Meeting, and Dr. Duncan as alternate.

Geo. W. Bushong initiated a discussion of public health problems.

The society agreed that Child Welfare Conferences should be held in eight different centers of the county and offered their assistance at these conferences. The centers were to be Tompkinsville, Gamaliel, Fountain Run, Akersville, Flippin, Vernon, Meshack, Skeggs Creek.

A tuberculosis clinic was discussed and the Society planned to have a clinic in co-operation with the Monroe County Health Department some time in the near future.

A motion was made and seconded that the Society ask State Board of Health to send a speaker to Tompkinsville on May Day to give a public address. Dr. Geo. W. Bushong was asked to make arrangements for the speaker.

The society unanimously indorsed the work of the Monroe County Health Department and offered their assistance in any phase of the work.

The society adjourned to meet again May 1st, 1929.

GEO. E. BUSHONG, Secretary.

Monroe: The Monroe County Medical and Dental Society met June 19, at the office of the Monroe County Health Department at 10:30 a. m.

Members present were: Drs. R. F. Crabtree, R. F. Duncan, J. T. Smith, H. B. Ray, J. F. Marrs, J. W. Bowman, J. T. Hughes, Geo. W. Bushong, Geo. E. Bushong, L. R. Crabtree, J. A. White, J. W. White, Earl Bryant. Every practicing physician in the county was present.

Dr. Geo. W. Bushong, Director of the Monroe County Health Department read before the society a letter from Dr. Lock, Secretary of the Kentucky Tuberculosis Association, in regard to a chest clinic at Tompkinsville. The society voted unanimously to send Dr. Lock a written invitation to come to Monroe County July 16th and 17th. Other matters relating to the clinic were discussed and each physician seemed eager to do all in his power to make the clinic a success.

Dr. Bushong also read a letter from Dr. Robert, Director of the Bureau of Trachoma, in re-

gard to a tonsil clinic in Monroe County. Each physician offered his support.

The society then adjourned to meet at the home of Dr. and Mrs. H. B. Ray, where lunch was attractively served. Before leaving their home a vote of thanks was made for Dr. and Mrs. Ray's excellent entertainment.

The society met again at one o'clock at the health office. Drs. Crabtree and Smith brought before the society a very interesting case. The meeting was turned into a clinic and the case brought out much interesting discussion which was participated in by every one present.

Before adjourning, Dr. Hughes made a motion that the society help Dr. J. W. White in any way possible in securing a pension. The motion was passed.

Dr. White is an aged member of the society, who by his untiring effort and devotion to his profession, has made a lasting impression on those of his profession and community, who know him well.

In the afternoon, the wives, daughters and sisters of the physicians of the county organized a Woman's Auxiliary to the Monroe County Medical Society.

G. E. BUSHONG, Secretary.

Scott: Scott County Medical Society met at the City Hall, June 6th, 2 p. m., with Dr. J. W. Baird, president, presiding. Minutes of previous meeting read and approved.

Old business, report of the Hospital Committee which was composed of Dr. Knox, Roberts and Amerscn. This committee was to co-operate with the Hospital Board for raising funds for x-ray equipment for John Graves Ford Memorial Hospital. Results of funds from two picture shows amounted to \$87.55. The committee was thanked for their services and dismissed.

Members present: Drs. J. W. Baird, E. A. Anderson, D. B. Knox, H. H. Roberts, L. F. Heath, W. S. Allphin, S. S. Amerson, J. E. Pack, C. T. Lancaster, H. V. Johnson, P. H. Crutchfield, and Dr. E. C. Barlow. Visitors, Drs. Daugherty, Orr and Ussery, of Paris, Dr. D. M. Farris, S. M. A. man from California, John Henderson, of Georgetown and Dr. C. J. Broeman, of Cincinnati.

New business, a committee was appointed to co-operate with the Hospital Board to raise funds to purchase the x-ray machine for the Hospital, as follows: Drs. C. T. Lancaster, W. S. Allphine, L. F. Heath and E. A. Anderson. No other unfinished or new business, we were delightfully entertained by a very scientific piece of research work for the "Treatment of Carcinoma of the Fundus," by Dr. C. J. Broeman, of Cincinnati.

This society is certainly indebted to these scientific men, who are willing to give up their time to bring us such very instructive and timely messages in the treatment and prevention of disease. The discussion was opened by Dr.

Daugherty, of Paris, followed by Drs. Orr, Ussery, Knox, Anderson and others.

No further business, meeting closed.

A. STEWART, Secretary.

Wolfe: We the following members of the Medical Society of Wolfe County, met at Camp-ton, Friday, May the 9th for the purpose of re-organizing the Wolfe County Medical Society, whereupon Dr. Taylor Center was made permanent chairman, and Dr. G. M. Center Secretary and Treasurer. Resolved, that the dues for each member in Wolfe county shall be one dollar per annum in advance.

Resolved, that the place of meeting be in Dr. Cox's office on the first Monday in each month. And that Dr. Cox write a paper on Smallpox, and Dr. Taylor Center write a paper on Diphtheria, and Dr. M. Center write one on Summer Diarrhea, to be read at the next meeting.

Resolved that we pay up the dues to the State Medical Association. Whereupon Dr. J. L. Cox, Dr. G. M. Center, Dr. Taylor Center had sent his dues in some time ago.

There being no further business, on motion we adjourned to meet at the regular time and place.

TAYLOR CENTER, Chairman,
GK. M. CENTER, Secretary.

Franklin: The Society met for its regular monthly session on June 6, 1929, in the Writing Room of the Capital Hotel.

Members present were: Drs. John Patterson, R. B. Ginn, G. A. Budd, C. T. Coleman, E. C. Youmans, A. M. Lyon, F. M. Travis, A. M. Jackson, O. B. Demaree and L. T. Minish.

The Society was called to order by the President, Dr. Patterson.

Minutes of the last meeting were read and approved. A communication from the A. M. A. concerning the standards of ethical hospitals, was read and ordered filed for future reference.

Dr. Youmans had charge of the program and presented Dr. W. A. Poole, of Lexington, Ky., who read a paper on the Tonsil as a foci of Infections. Dr. Poole's paper was very interesting and highly instructive and brought forth much discussion as every member present took part. Many questions were answered by the essayist in closing the discussion.

The Society then adjourned to the Hotel Dining Room for lunch.

L. T. MINISH, Secretary.



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KENTUCKY MEDICAL JOURNAL



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BOWLING GREEN, KY., SEPTEMBER, 1929

No. 9

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In this new (1929) volume, to illustrate the very definite appeal of the book to *practitioners*, there are articles on the diagnosis of gastric ulcer, the nature and treatment of toxemia of intestinal obstruction and ileus, treatment of neurosyphilis by malaria, ketogenic diet treatment of epilepsy, focal infection in chronic and recurring diseases, preventive medicine . . . to mention only a few articles from which the practitioner will derive practical help. In all, there are 196 articles with 288 illustrations.

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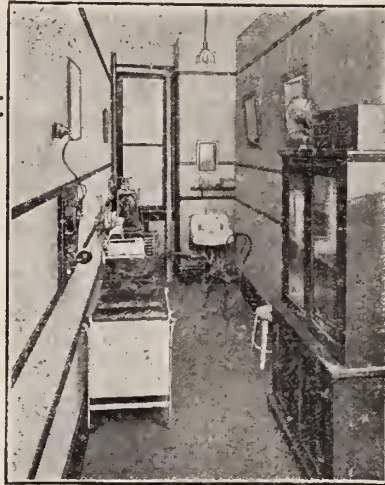
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Medical Director

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XXVII.

BOWLING GREEN, KY., SEPTEMBER, 1929

No. 9

EDITORIAL

OUR STATE MEETING

Dr. G. S. Hanes, our president-elect, with the Committee on Entertainment from the Jefferson County Medical Society, has been busy all summer arranging for the Annual Meeting, October 21-24, so as to assure every physician who attends not only a profitable time during the scientific session, but a pleasurable time during play hours. We now have a larger paid up membership than we have had for a number of years, and with the number of letters and inquiries coming in regarding the meeting, we are sure to have one of the most successful that has ever been held in Louisville. Our commercial exhibit space is almost filled, and this in itself gives the doctors a glimpse of the newer things in physical therapy, drugs, and other equipment in the practice of medicine. If any of your confreres have failed to pay their dues, please tell them what an interesting meeting we are going to have at the Brown Hotel in October.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY

The fifteenth edition of the American Illustrated Medical Dictionary, Dorland, just revised, is clearly the outstanding Dictionary in the medical field today. It is in reality a new book having been entirely reset from cover to cover. Thousands of new words, which are not to be found in any other dictionary on the market, are listed and defined in the new Dorland.

The terminology used throughout has been standardized by a special committee of the American Medical Association headed by Dr. Morris L. Fishbein.

Special committees of the various scientific societies have combed the literature for the latest and most up-to-date words in their field. Nothing has been omitted which can make this book the most complete and authoritative available today. New type has been used throughout which enables the reader to use the dictionary without eye strain.

Many new illustrations are included. This has always been one of the outstanding features of the American Illustrated Dictionary.

Some of the outstanding features of this new dictionary are: It contains the B. N. A. terminology in connection with anatomical

terms, the official nomenclature of the American Chemical Society, the Council of Physical Therapy, the Council of Pharmacy and Chemistry, the Association of Pathologists and Bacteriologists, the American Radiological Association.

This valuable book is published by W. B. Saunders, Philadelphia, Pa., for many years an advertiser in the Journal.

THE ANNUAL NUMBER

The October issue of the JOURNAL—the Annual Number—will contain the reports of the officers and full details of the financial condition of the State Association. This issue of the JOURNAL will reach you in ample time to study the business affairs of your Association and you will know in detail all that has been accomplished in the last year.

The Association can only make progress and accomplish results in proportion as its members manifest interest in it. It is therefore your duty to study these reports, and, if possible, discuss them in your County Society so that any criticism, suggestion or commendation you wish to make may be carefully crystallized and your delegates can be acquainted with the feeling and attitude of the local profession.

The Constitution and By-Laws of each County Medical Society require that three censors be elected. All problems with reference to ethics and differences of opinion among members should be referred to the Board of Censors without debate. However, general principles, in regard to practice, mal-practice and public health procedure, should be discussed freely in the Society. At the opening of every meeting, it is suggested that the President call on the members to bring up any matter which is of interest to them in regard to the welfare of the profession. The medical profession of Kentucky has the respect of its citizens and to it has been delegated the task of protecting the public from preventable disease. The State Board of Health is the legal arm of the Kentucky State Medical Association, and, in turn the County Board of Health is the legal arm of the County Medical Society. Through these agencies, the knowledge of the profession is made useful in the battle for the people of the Commonwealth against communicable diseases, quackery, nostrums, ignorance, poverty

and other evils that prey upon the sick poor.

A doctor, who fails to attend his County Society or State Association, has difficulty in keeping up with the newer methods and equipment necessary to wage a successful battle against unnecessary disease. From week to week progress is being made in method or technique and these changes, as well as true and tried methods should be freely discussed at medical meetings. The contacts with one's associates from other sections of the state is a mental stimulation. Those who attend the medical meeting come back to practice with renewed vigor, increased enthusiasm, a broader outlook upon life, a more worthy citizen and a happier warrior against disease.

THE POST GRADUATE COURSE

The second special Post Graduate Course of the Kentucky State Medical Association has just closed with an attendance of forty-five. While there were not so many present as at the first Course held last year, the majority of the men felt that the increased individual attention made the Course even more attractive and helpful. While the main structure was the same as the previous year there was variation in the teaching faculty and the subjects presented. Perhaps the outstanding features were the special hours in the State Health Laboratory at Sixth and Main, the lunch and ward rounds held at the Children's Hospital and the all-day intensive lectures and lunch at Waverly Hills Tuberculosis Sanatorium.

The remarkable thing about these Courses is the hearty co-operation of the doctors and teachers who filled every hour with good practical talks. It is hoped that the State Medical Association will see its way clear to continue these Courses and that more and more of our physicians throughout the state will avail themselves of the opportunity to brush up on the latest advances in medicine and at the same time to have that pleasant social contact with other doctors which after all means so much in life.

THE EYE, EAR, NOSE AND THROAT SECTION

Each year the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association holds its Annual Meeting in May. This year it was held in Lexington. The Journal always takes a great deal of pleasure in printing in this issue, its proceedings and all its papers with discussions in full. We hope that every practitioner in the state will read these articles and discuss them in their County Societies. No greater benefit can be given to the human race than the early re-

cognition of the presence and the removal of enlarged tonsils and adenoids, and the correction of eye defects and as these cases are first seen by the practitioner, these specialists should work hand in hand with the doctor and all the progress that they make in their profession should be shared with the general practitioner.

THE RADIOLOGICAL SOCIETY

The next meeting of the Radiological Society of North American will be held at Toronto, December 2nd to 6th, inclusive. Headquarters at the Royal York Hotel. The facilities and accommodations at this hotel are the best in the history of the Society and we expect to have a banner meeting in every way. The Scientific Program, Clinics, Scientific and Commercial Exhibits will be of the highest character and exceedingly interesting and instructive. The program will be interesting not only to the Radiologists but to the Physicians practicing other medical specialties and general practice as well. A cordial invitation is extended to all physicians as well as radiologists to attend the Toronto meeting. Secure reservations at once through Dr. W. C. Kruger or Dr. G. R. Reid, 20 College street, Toronto, Canada. Excellent arrangements have been made to take care of the visiting ladies. More and more the general practitioner is becoming interested in this subject and the Society welcomes them to these meetings.

THE GOLF TOURNAMENT

Arrangements have been completed for the Golf Tournament at the Annual Meeting. The committee composed of Dr. D. Y. Keith, Chairman, R. G. Spurling and J. A. Kirk have secured prizes and every physician, whether he can play or not is eligible.

The Louisville Country Club, Big Springs Country Club and the Audubon Country Club have extended the privileges of their club to our members, and the players can take their choice of these links.

The tournament can be played from Saturday, October 19th through Thursday, October 29th. These dates are selected so that every doctor will have an opportunity to enter the tournament and not miss any part of the program.

Prizes, including a presidential trophy by Dr. Granville S. Hanes, will be given for low gross. Also a kickers tournament will be played with two or more prizes for the lucky ones.

THE MEDICAL VETERANS AND THE CONVENTION

No special group made more contribution to the success of our army during the World War than the members of the medical profession. Since the war, doctors everywhere have become actively interested in the affairs of the American Legion, probably the most influential organization in this country today. The Legion has conducted its program with a dignity that has inspired universal confidence in its leadership. Its annual conventions have been mile stones in progress in keeping alive the spirit that our most patriotic citizens would wish for our country.

For these reasons the former medical officers in the army are especially interested in the approaching convention of the American Legion in Louisville. The medical profession of Louisville is not unmindful of this interest. Early in the year they began to informally organize and Dr. Garland Sherrill was made chairman of the reception committee, Dr. James S. Lutz of the executive committee and Dr. A. T. McCormack of the general committee on arrangements. Plans have been completed for the provision of rest and reception rooms and for the entertainment of the many medical visitors who are expected.

The Louisville committee is very much delighted at the receipt of a letter from Dr. John O. McReynolds, president of the Medical Veterans of the World War, saying that an informal meeting of this organization will be held during the Convention. The Medical Veterans is a branch of the American Association of Military Surgeons and its members gather together at the annual meeting of the American Medical Association and at other medical conventions for delightful informal conferences and exchange of experiences and opinions.

The medical profession of Louisville and of all Kentucky expresses the hope that all of the medical veterans of the World War will be present at the American Legion Convention at Louisville, September 30-October 3 and help make it a success.

Inventor of Soda Water—The inventor of soda water was Rev. Joseph Priestly, who was also a chemist and the discover of oxygen. He was persecuted in his own country, England, for political reasons, so sought refuge in Pennsylvania, where his experiments gained the interest of the Philadelphia doctor, Philip Syng Physick, and he induced a local druggist to prepare carbonated water for his patients, adding fruit juice as a flavor. Thus in 1807 the soda water business came into being.

SCIENTIFIC EDITORIAL

TREATMENT OF TAPEWORM

Tape worm is not an uncommon infestation in Kentucky especially the tenia or dwarf tape worm, and a successful treatment is rather difficult to obtain. The following procedure has proven very satisfactory and we commend its use:

The patient should be placed on a liquid diet for two or three days and should gradually cleanse the bowel by the use of the following prescription:

Magnesii sulphatis.....60 gm.
Spiritus chloroformi.....15 c. c.
Aquae..... q. s. ad 200 c. c.

A tablespoonful, in water, three times a day, an hour before meals.

An enema of soap and water may be given at night. The night before the final treatment is to be administered the patient is given a larger dose, perhaps two tablespoonfuls of the above mixture, and he then takes no food and but little liquids. The next morning after the bowels have moved male fern may be given as follows:

Oleoresinae aspidii, 4 gm; Fac capsulas, 8.

Four capsules, with half glass of hot water at 9:00 a. m. and four capsules with hot water at 10:00 a. m. (Important: Before taking capsules each one should be uncapped.)

At 12:00 o'clock three tablespoonfuls of the magnesium sulphate mixture should be taken to insure the rapid passage of the male fern through the intestine, lest too much absorption take place.

During the morning no nutrition should be taken other than black coffee, clear tea, or bouillon.

Except when momentarily otherwise engaged, the patient should be in bed, and should stay in bed the remainder of the day. For unavoidable faintness coffee may be administered at any time, or a hypodermatic injection of strychnin may be given. After 1:00 o'clock any food may be given the patient that he desires.

During the three or four hours of this active treatment, viz., from 10 a. m. to 1 or 2 p. m., the physician should remain with the patient, or a trained nurse should be in attendance.

Spinal Anesthesia in Cesarean Section.—Only spinal anesthesia supplies the ideal conditions of contraction, retraction and, hence, bloodlessness of the uterus which is to undergo cesarean section. Absence of hemorrhage during the operation and for some time afterward is one of the factors which count most for the cicatrization of the uterine wound.

OFFICIAL ANNOUNCEMENTS

OFFICIAL MINUTES OF THE EIGHTH ANNUAL SESSION OF THE EYE, EAR, NOSE AND THROAT SEC- TION OF THE KENTUCKY STATE MEDICAL ASSO- CIATION

HELD AT THE LAFAYETTE HOTEL, LEXINGTON,
KENTUCKY, MAY 22nd-23rd, 1929
EVENING SESSION, WEDNESDAY, MAY 22, 1929

The Annual Dinner was served in the Red Room of the LaFayette Hotel at 7:00 P. M. about sixty members and guests being present. Dr. Meyer Wiener, of St. Louis, Mo., was the guest of honor.

At the conclusion of a delightful banquet, about 8:15 P. M., the section was called to order by the retiring president, Dr. J. A. Stucky, Lexington, who spoke briefly concerning future work and aims of the section. The incoming president, Dr. J. D. Williams, Ashland, was then escorted to the chair, and, after presenting his annual address, "The Paranasal Sinuses," introduced the guest of honor and principal speaker of the evening, Dr. Meyer Wiener, of St. Louis. Dr. Wiener then delivered an interesting and informative address on "Plastic Surgery for Correction of Optical Defects," and exhibited numerous lantern slides to illustrate various technical phases of the subject.

The section adjourned at 10:15 P. M. to reconvene in the Red Room Thursday morning, May 23rd, at nine o'clock.

MORNING SESSION, THURSDAY, MAY 23, 1929

Section called to order by Dr. J. D. Williams, president, at 9:30 A. M. Registration about forty members.

The official minutes of the 1928 session were read and approved.

The following were admitted to active membership:

- Dr. W. S. Weldon, Glasgow.
- Dr. Will R. Pryor, Louisville.
- Dr. F. W. Urton, Louisville.
- Dr. Earl C. Yates, Lexington.

The president read letter from a Cincinnati physician asking members to attend lecture and demonstration to be given in that city Monday night, May 27th.

Dr. Gaylord C. Hall, Louisville, said there had been some criticism because members of this section did not attend regular sessions of the state association; that he had conferred with Dr. McCormack, Secretary, who had promised the section members would have representation on the state program this year to induce them to attend the regular session. However, the date of the state association meeting this year conflicted with that of the

American Academy of Ophthalmology at Atlantic City, hence members of the section could not attend both. Upon motion the secretary was requested to write Dr. McCormack asking that hereafter meetings of the state association be not held on dates conflicting with national medical societies, thus enabling section members to attend the general sessions.

Reports of Dr. S. B. Marks, treasurer, and of Walter Dean, secretary, were presented and upon motion accepted.

The president reported that question had been raised whether section members not attending the sessions, nor participating in the annual dinner, should pay dues of \$5.00 per year. After considerable discussion, the following motion prevailed: "That the annual dues of this section be made \$3.00 per member, and that those attending the annual dinner shall pay approximately \$2.00 additional." (This changes resolution adopted at the Louisville meeting in 1925).

The president stated that three members of the section had died since the last meeting, and upon motion a committee was appointed to draft suitable resolutions to be presented at the next regular session.

It was moved and carried that Dr. Meyer Wiener, of St. Louis, be made an honorary member of this section. It was further moved and carried that all previous guests of honor, be also made honorary members of the section.

SCIENTIFIC PROGRAM

The first paper, entitled, "Fractures of the Nose," was read by Dr. Charles K. Beck, Louisville. Discussed by Drs. Drake, Bass, Marks, Dean, Reynolds and Wells.

The next paper on "The Etiology and Treatment of Phlyctenular Kerato-Conjunctivitis," was read by Dr. Frank W. Pirkey, Louisville. This was followed by a paper on "Report of Unusual Eye Case: Traumatic Corectopia," by Dr. R. M. Armstrong, Lexington. These two papers were discussed together by Drs. Wiener, Bledsoe, Stucky, Cowley, and closed by Dr. Pirkey.

Dr. W. A. Poole, Lexington, then read a paper on "Chronic Suppurative Otitis Media: Classification and Treatment," and Dr. G. W. White, Henderson, followed with a paper entitled "A Few Thoughts on Chronic Suppurative Otitis Media." These two papers were discussed together by Drs. Hall, McClure, Drake, Reynolds, Yates, Bass, Baker, Stucky, Pryor, Cowley, Pirkey, Dean, and in closing, by the two essayists.

Adjournment at 12:45 p. m. for lunch in the Gold Room of the Lafayette Hotel.

AFTERNOON SESSION, THURSDAY, MAY 23, 1929

At conclusion of the luncheon, there was a very interesting round-table discussion on "Therapeutic Stunts" in ophthalmology and

otolaryngology, in this all the members participated.

The section was formally called to order by Dr. J. D. Williams, president, at 2:00 P. M.

The following officers were elected for 1930:

President, Dr. Gaylord C. Hall, Louisville.

Vice-President, Dr. Murison Dunn, Richmond.

Secretary, Dr. Walter Dean, Louisville, (re-elected).

Treasurer, Dr. S. B. Marks, Lexington, (re-elected).

The last paper on the program, "Laryngeal Stridor and Dyspnea in Children," was read by Dr. Earl C. Yates, Lexington. Discussed by Drs. Stucky, Marks, Wells, Dean, Williams, Beck, and in closing by the essayist.

The president thanked the members and officers for their hearty co-operation and splendid work, and then announced that the next meeting of the section would be held in Louisville, the time to be determined by the committee.

There being no further business, the section then adjourned to meet at Louisville in 1930.

WALTER DEAN, Secretary.

Carriers for Colds.—When colds "run in the family" it is no sign that the family is constitutionally subject to colds. It may be that some member of the family is acting as a carrier, just as some people are typhoid carriers, suggests Dr. P. Watson-Williams in a report to the Practitioner, London, of observations made on ninety consecutive patients. Sometimes one child is known for starting colds among his brothers and sisters. This same child may become immune to colds himself but still harbor cold germs and be able to pass them on to others. If he grows up and has a family, he may still be starting colds in the family, although they are no longer traced to him.

The reason for this may be an unsuspected infection of his nasal sinuses. The same infection may be the reason for some children growing a second set of adenoids, when the first ones have been removed with the tonsils, Dr. Watson-Williams thinks. He also reports a tendency for families that are prone to colds to have infections, in the abdomen, for instance in appendix and gall bladder.—Science News-Letter.

ORIGINAL ARTICLES

PRESIDENT'S ADDRESS

"THE PARA-NASAL SINUSES"*

By J. D. WILLIAMS, M. D., Ashland, Ky.

As briefly as is consistent, I propose giving a resume of the more recent advances and developments relative to the accessory nasal sinuses, with particular attention to treatment. This by reason of the great interest centering about these cavities on the part of rhinologists, but as well that of the pediatricians, the latter of whom are coming more and more to an appreciation of the assistance the former may give in many obscure conditions, notably in connection with the relationship of certain intestinal disturbances to otherwise symptomless, and hitherto generally ignored, involvement of the antrums maxillary and mastoid.

During the past two years a great deal has been written concerning the para-nasal sinuses of children, and it is pleasing to note the tendency to more conservative treatment. The writers do not always convince one that the diagnosis is established beyond doubt. Because a child is given to colds and is generally physically sub-normal, does not necessarily justify a diagnosis with one form or another of nasal treatment, unless there are other and objective signs of a chronic sinusitis. Shambaugh questions the involvement of sinuses in children in other than exceptional cases, and sets forth that, in view of the probability of undue traumatism in operative procedures, the indications are for the *simplest* measures of treatment; while McWilliams seems radical in saying the sinuses should be investigated in connection with every tonsillectomy. Leyda, in agreement, observes, "In our eagerness to remove foci of infection, the tonsil often suffers the fate of the innocent bystander."

Perhaps there is no better time than now to tender my grateful appreciation to the College of Surgeons who have supplied me with an immense amount of literature, domestic and foreign, from which this review has in the major part been prepared. This has made possible a much broader survey of the field than is ordinarily open to the surgeon who has access only to the usual journals and year-books.

Since the trend of attention in rhinology is decidedly antrum-ward, this address will deal almost entirely with that cavity, and, that we may obviate too lengthy a review, aspects other than treatment will be given no more attention than is absolutely necessary. Lockard and Argall go so far as to say that 71 per

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cent of all sinus troubles are maxillary, and they assert that the antrum is of equal importance with the teeth and tonsils in the causation of secondary infections. Tunis reports a series of 50 mastoid operations, in 82 per cent of which, one antrum (or both) was involved. These statistical findings seem to be generally approved by other investigators. Among other current articles specifically on the importance of the maxillary antrum are those of Stauffer, Thomas, Perry, Oertel, Ruskin, Maltz, Qualls, Watson-Williams, evidencing the almost universal interest in this cavity.

Aside from such symptoms as are recognized as being classical, there is evidence of a more critical interest, in that reports are being made of unusual indications. Dabney mentions a case wherein the single symptom of subjective bad odor was presented; Hett, of Britain, likewise. Tunis says that nearly one-third of his cases showed no nasal symptoms, the diagnosis hinging upon the seeming insignificance of subjective odor or taste, loss of weight, sneezing. The speaker recently, on suspicion, irrigated a young lady's antrum whereupon her persistent sneezing ceased. Lockard and Argall report a perverted sense of taste in an adult woman who had lost 50 pounds in weight before the antral sinusitis was found to be the cause. Vaso-motor rhinitis of all seasons of the year is mentioned by several writers as of diagnostic importance. As to some of the classical symptoms, in general given scant attention here, there is a striking difference of opinion. For example, Mercer suggests operative treatment of the antrum because of post-nasal dropping, while Shambaugh states it as a clinical fact that in most cases this manifestation has nothing to do with sinus trouble.

Jans and Floyd stress the fairly frequent connection of cholera-infantum with mastoiditis or maxillary antritis, and make the surprising statement that, except in acute cases, 30 per cent of antritis patients present no symptoms, objective or subjective. Lockard and Argall, along with cardiopathies, nephritis, and symptoms not strictly classical but frequently seen, find also chorea, anemia, eyelid vomiting, and symptoms under the general head of nervous instability. It is an unique series of Watson-Williams in which six members of the same family all suffered from chronic sinusitis, and all finally came to appendectomy.

Levda maintains that not only does sinus discharge cause tonsillitis, but that many so-called adenoid recurrences are merely lymphoid evidences of such infection. Felty and Healy in 6 cases of lobar pneumonia were able to culture pneumococci of the lung type from the nasal discharges, and pneumonia was pro-

duced in rabbits by injecting into their antrums pneumococci from human sinuses, as reported by Mullin and Ryder. Incorrect diagnoses were made in one-third of supposedly tuberculous French soldiers, as Sergeant points out, the bronchial condition being only an incident in sinusitis; and Saylor, in the same series, found infected sinuses in all autopsied pneumonias. Stimson reports a sinus infection with constitutional effects wrongly diagnosed as tuberculosis. Darling, affirming that "... the portal of entry of the pneumococcus is usually a nasal sinus," found acute inflammatory changes in sinuses in 90 per cent of a series of pneumonias.

Again, from Lockard and Argall, we learn that in asthma, "... the results of sinus treatment are frequently brilliant," they citing striking cases of a woman and a child, in which irrigation of the former on several occasions immediately relieved her asthma, and in the child, eight years old, asthmatic from birth, change of climate, treatment based on allergy, etc., having failed, drainage of the antrum produced a complete cure. Sonnen-schein, as early as 1925, stated that the Klebs-Loeffler bacilli caused a purulent antritis which was cured by antitoxin alone. According to Adams, Raffo, and Mullins, chronic sinusitis sustains a causal relationship to bronchiectasis, the transmission of the infection being by direct inhalation, or through the lymph-vascular system.

Along with other strange happenings in connection with the sinuses, Wilson tells us that 104 writers report foreign bodies, such as teeth, calculi, gun missiles, etc., in the antrum, and that these may be tolerated for years without suppuration. Seudder mentions strongly chlorinated swimming water as a not infrequent cause of antritis, and F. E. Hasty says, "Man's lack of adaptability to aquatic life is really quite apparent."

As to antral disease originating from the teeth, Hirsch, eminent nasal pathologist, found but one specimen in 1000 cases, and Dixon in 100 found but two. Tribble says that dental infections may spread through a perfectly sound floor by way of an osteitis with thrombo-phlebitis to the anastomosing antral veins. Brown condemns curetting the tooth socket, while D. C. Smith emphatically says that an oral surgeon should at once refer any case of antrum trouble to a rhinologist. The same writer, with whom Hett and others generally are in agreement, says that the fewest possible number of irrigations should be made through the socket. Several blame the dentist for the infection, that in the extraction rocking the fractures into the antrum, another argument in opposition to oral treatment. The general opinion is that the incidence of teeth as a cause of antritis has been greatly over-

estimated, being not more than 19 per cent (Johnson of Mayo's), if that much.

Opinion as to the diagnostic worth respectively of x-ray and transillumination is decidedly controversial. Hett says that transillumination of the maxillary antrum is "most useful," while of the frontal, "very inconclusive, though, negatively, generally most valuable, since if all sinuses show clear, sinusitis can be definitely excluded." If a large polyp occupies the antrum, the latter will be hyper-clear to transillumination, but dark on the radiograph. Israel believes all antral disease to be secondary, and asserts that transillumination is inaccurate, and that indefinite results from the x-ray are due solely to faulty technic. Cline strongly prefers transillumination. Mitchell advocates the roentgen-ray to determine the hyperplasia, or the presence of polypi with absence of pus. Skillern estimates the efficiency of the rays at 85 per cent in the antra. From the Mayo clinic (Johnson) 300 cases of maxillary sinusitis are reported; the rays were used in all, and he says it was possible to diagnose 67 per cent by this means, and 92 per cent from clinical data alone. But cystic antritis was recognized from roentgenograms alone, they being 87 per cent efficient in this field. L. E. Brown questions the value of the x-ray—thinks it only corroborative—except in abnormalities of sinus structure, where he holds it indispensable. Qualls places his main dependence on transillumination, using the Cameron light. Lobell recommends iodized oil in connection with the roentgen-ray, the oil having perhaps some therapeutic value also.

Vreeland performs no intra-nasal operations without exhausting the allergy tests, and, incidentally, absolutely interdicts salt in the diet of all pathologies of the nose. L. E. Brown values the tuning fork and otoscope. Dixon avers that the antrum headache "is the most important of all symptoms." Morse, elaborating on Holmes' idea, presents the operating and visualizing sinuscope, obviously a forward step in obscure non-purulent conditions.

As demonstrating that simple needle puncture is not a minor procedure, Skillern reports 10 sudden deaths in its performance, and questions whether the instrument was merely imbedded in swollen mucosa and not in the cavity. On the other hand, Johnson, of Mayo's clinic, says that in the 300 cases mentioned above, there was not a single untoward result. He further states that when the history suggests it, puncture is always advisable, regardless of clinical or roentgenographic findings, in determining the diagnosis. Ross relates a severe delayed hemorrhage with hematoma from simple needle puncture. Ravdin recommends more frequent

needle puncture, urging it for children as well as for adults, claiming the procedure to be eminently safe if proper precautions are taken. Mithoeffer favors diagnostic puncture through the membranous middle meatus. Israel thinks that conclusive diagnosis cannot be maintained from a negative puncture result. Schaeffer, the anatomist, warns that when one thinks he is entering through the normal aperture, it is more than likely the opening is through the undefended floor and lateral wall of the ethmoid infundibulum. Cline introduces air first, and not through the natural ostia, while Jervey does the opposite, and Skillern expresses the general fear of inflation.

In the light of the tendency to malignancy of papillomas, polypi, and other presumably benign growths, Saxen condemns intra-nasal attempts at removal. Thirty-two per cent of the jaw resection patients of this type died of pneumonia, while in the Caldwell-Luc and Moure cases, the patients lived two to three years. Kilgore and Chamberlain report a case of antral carcinoma of twenty years' duration. Klestadt and Martinstein found that in a series of 58 sinus malignancies, 49 were carcinomas and 9 sarcomas. They advocate radical operation first, then x-ray or radium, or both. Another exponent of radical surgery followed by radium or the rays, is Quick, asserting that the tumor tissues can be eradicated only after proper exposure and drainage. New reports 97 cases of antral malignant tumors treated by radium, cautery, and diathermy. Ninety-six of 186 in his observation were primary of the antrum. He uses block anesthesia, and does not ligate the external carotid, as routine. It seems clear that diathermy is demanding and receiving much consideration as a substitute for more radical procedures, and Holgren and Hofer are rather enthusiastic as to this measure when followed by x-ray or radium.

As to intra-nasal surgery, conservatism grows—a most encouraging sign, to my mind. Harkness well expresses the tendency in the following words, "... the largest group of patients suffering from para-nasal sinus disease is the chronic catarrhal class, and I believe the radical surgery that has been practised upon these patients stands to the discredit of our profession." Specifically referring to the ethmoids, but in positive endorsement, is Skillern, defying "a master to restore it (intra-nasal tissue damaged by radical surgery) to its former morphological configuration." Both Olsho and Dowling are non-surgical enthusiasts, the former proposing the postural, and the latter the tamponage plan.

There seems a wide belief in the efficacy of silver protein tampons, the so-called "Dowling plan," and without previous anesthesia or depletion. I cannot imagine more than a very

small percentage of patients in private practice calmly submitting to such a procedure in an extremely sensitive area without a fair degree of previous numbing. However, Hollender and Cottle, in advocacy of the tampon idea plus diathermy, tell us the use of the latter frequently obviates resort to analgesic drugs; then, if one be an optimistic soul, he may assume such temerity minus the fear of being known as "a good doctor, but a darned rough one."

In the May number, 1925, of the *Australian Medical Journal*, Pern, apparently dissatisfied with his results from ordinary methods, offers colloidal manganese in nasal diseases, saying this is almost a specific; that four to eight injections, covering a fortnight, will clear up not only the local state, but also the remote sequelae. There are no further details given in this short abstract. Fenton reports having 73 per cent success in sphenoid disease with an autogenous vaccine from hemolytic streptococci, while from the non-hemolytic type 30 were cured. Alcohol in 50 to 95 per cent solutions, or silver nitrate in 7 to 15 per cent solutions, is used by Skillern if the mucosal condition is such as to preclude regeneration by aeration and irrigation. This failing, surgery is of course the next resort, and for the radical, he recommends the Luc or Denker.

Qualls condemns mere puncture irrigation, advocating wide opening, asserting that 90 per cent will thus promptly get well, the remaining 10 per cent being of the polypoid or hyperplastic mucosa type. McGivern decries irrigating through other than the inferior meatus, claiming that the normal openings are too small. He further thinks if there is proper normal opening with needle puncture, the patients' own efforts in vigorous nose-blowing will at times be sufficient. Mercer, studying 230 cases of the chronic type, maintains that 85 to 94 per cent will be cured by operative intra-nasal aeration and drainage.

As to the highly favored Caldwell-Luc and Denker operations, surgeons find ground for dispute, some advising against a low opening as endangering the tooth roots or the spongy bone over them, while others are equally specific against a high entrance, out of respect to the infra-orbital nerve. Stimson's invariable rule is not to sacrifice physiologically functioning tissue if it can possibly be avoided, his keynote being conservatism. He makes an infra-turbinal window, and as a final resort, uses the Caldwell-Luc or Denker. Gilmer prefers the Caldwell-Luc with muco-periosteal flap. Citing the histories of 385 maxillary sinusitis patients treated by what he calls conservative surgery, Hemstead says that those of dental origin make rapid recovery with simple drainage and ventilation, while

those of nasal origin, particularly if there be antral polypi, require radical treatment, and make slow restoration.

Kyle says that no sinus operation can be approached with indifference. Hett reports that severe or fulminating cases may be followed by meningitis, septicemia, frontal vein thrombosis, and edema of the brain; and Looper warningly points out the close relationship anatomically. Mithoeffer uses the blunt-pointed tube through the accessory ostia, but warns against interference during the inflammatory stage, reporting three deaths in the Basle clinic, even though the blunt tube was used there. Bass submits a case of spontaneous antral hemorrhage, finally controlled with thromboplastin packing.

Not a small minority irrigate not at all, while all, except for Cline, who insists on six weeks' irrigation before more radical interference, agree on its early discontinuance. Alden has devised a flanged rubber tube, after the fashion of the pleural empyema drainage plan, to be used in children, inserted under the inflected and elevated inferior turbinate, through which the necessary 10 to 14 days' irrigation may be carried out.

The difficulties of making the antra-nasal opening far enough forward and low enough that the pyriform fissure may be more nearly reached, seem to be measurably overcome by the ingenious instrument of G. E. Hourn, which he calls his anterior bone resector. This, with the Sluder handle, gives considerable leverage, and requires little space.

Regarding a subject of much former discussion—the supposed ocular complications of sphenoid and ethmoid involvement—the wave of enthusiasm for operations here is happily receding. In a discussion between ophthalmologists and laryngologists of the Royal Society of Medicine, the consensus of opinion was that the spontaneous cure of retro-bulbar neuritis is not at all infrequent, but there was no lack of emphasis on the necessity of clearing up all foci of infection. I shall report a recent case of this kind in my own experience, possibly tomorrow.

I offer no apology, gentlemen, for the lack of polished style, so obviously missing in this address, for you will agree with me that the exigencies of my subject matter would preclude more than a bare statement of "high points," and that, with no particular continuity. In the very nature of things, the hearers must draw their own conclusions.

FRACTURES OF THE NOSE*

By CHARLES K. BECK, M. D., Louisville.

There is a remarkable paucity of literature on this subject notwithstanding the common occurrence of nasal fractures. Rhinologists come into professional contact with so many patients suffering from nasal obstruction and deformities that are the result of neglected or improperly treated fractures, that it is incumbent upon us to bring this subject more frequently to the attention of the profession engaged in general practice and surgery. Many broken noses are never seen by a physician and many that are seen, are treated by applying a strip of adhesive plaster across the bridge of the nose. No surgeon would think of treating other fractures so negligently.

Lee Conen has written several papers on this subject, and a few others have written occasionally, but otherwise it has been neglected not only in this country but abroad.

Four bones and six cartilages constitute the framework of the nose. The two nasal bones, the vomer and the perpendicular plate of the ethmoid are the bones, and the cartilages are the upper and lower lateral, sesmoid and triangular.

In fractures of the nose occasionally the cribriform plate of the ethmoid, the lachrymal bone and the nasal process of the malar are involved.

Of the nasal bones the fractures may be vertical, oblique, transverse, comminuted or compound. Usually both bones are broken. There may be a fracture of one with displacement of the other. Fractures of the triangular cartilage are frequently complicated by dislocation from its attachment to the vomer and superior maxilla. Deviations in the cartilagenous portion of the septum are usually angular if caused by fracture.

In children neglected nasal fractures may lead to mouth breathing because of nasal obstruction. Other unfortunate results are anosmia, occlusion of lachrymal duct and deformity.

Direct violence being the cause, there is usually displacement. There may be nothing more than a cracking of the bones, in which case there may be no displacement and fracture may be recognized only by the pain, swelling and ecchymosis. If fracture of the nasal bone is vertical, one fragment may slip under the edge of the other, if oblique or transverse the lower fragment is depressed. In fractures of the septum there is usually overlapping with consequent thickening of the septum. This thickening is later increased by the laying down of callus much of which is still later absorbed.

Hematoma of the septum is not unusual. Where it is large it is best opened near the floor of the nose. Not infrequently emphysema occurs when the patient has attempted to blow the nose.

In preparing this paper no mention was found in the literature of treatment of fractures of the nose complicated with fractures into the cranial cavity, and this omission is the chief apology for this paper.

It has always been the practice of the writer to make no attempt at reduction or treatment of the nasal condition, other than to control hemorrhage or evacuate hematomata, where there exists good reason to believe there is an extension of the nasal fracture into the cranial cavity. To determine the existence of such a complication is seldom easy. An x-ray examination may demonstrate the fracture or it may not. If the dura has been lacerated much there may be escape of spinal fluid, but there may be considerable fracture through the anterior fossa without sufficient laceration of the dura to permit the escape of a noticeable amount of spinal fluid. Laceration of mucous membrane of the posterior wall of the naso-pharynx or pharynx is rather conclusive evidence of fracture of the base. Fractures caused by gun-shot or by penetrating objects, such as a splinter or pencil, are almost sure to communicate with the cranial cavity.

If such a fracture exists the patient's life is in danger. It is no time to think of consequent nasal obstruction or deformity. These things may be corrected at will later if the patient survives. Just a simple moving of the bones to make a diagnosis of fracture may be sufficient to pump some of the infectious nasal secretion into the cranial cavity and result in meningitis or brain abscess, the mortality of which is very high. The patient will not die of a broken nose or deformity or obstruction; but if by this manipulation a meningitis or brain abscess is caused, the chances are he will die. If there is no manipulation even though the fracture does communicate with the cranial cavity, unless the injury has been caused by some penetrating object, the outlook is still good. From the line of the fracture there is always some exudation of blood and serum. The direction of flow is always in the line of least resistance, which in this case is toward the nose and naso-pharynx. The germs found in the nose and naso-pharynx which produce meningitis and brain abscess are non-motile. There is no way by which they can stem this outward flow unaided. A very little and gentle manipulation may aid them and plant a fatal colony. Therefore, the surgeon should be reasonably certain that there is no fracture into the cranial cavity before attempting any treatment of the nasal

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condition except hemostasis.

Infection may be implanted on a hematoma that has not been evacuated. It is therefore best to drain hematomata that are large.

Following fracture of the lachrymal bone, because of injury to or pressure upon the lachrymal duct or sac, there may be constriction or stricture of same with a consequent epiphora.

The sooner after injury nasal fractures are treated the better with the one exception when there is a cranial fracture communicating with the nose or naso-pharynx. Where much time has elapsed there is so much swelling that satisfactory reduction is very difficult or even impossible. Where swelling has occurred, hot and cold applications will assist in reducing the swelling so that reduction may be made at as early a date as possible. Union takes place quickly because of the excellent blood supply. Hence adjustment should be made early.

Where hemorrhage occurs the first thing needful is hemostasis. This is secured in the usual way. Then a satisfactory examination of the interior of the nose may be made. Often satisfactory reduction and dressing may be made with the use of a local anesthetic, but there are times when a general anesthetic is best. Lee Cohen states that a general anesthetic is always necessary.

Reduction is accomplished by manipulation both inside and out of the nasal chambers. Adams forceps is a good instrument for the purpose. It is powerful and it is easy to use too much force with it. With this instrument the bridge of the nose may be lifted and fractures and dislocations of the triangular cartilage may easily then be reduced. Also with one blade outside the nostril and one inside the nasal bones may be manipulated and moulded.

Lee Cohen advocates strongly the fracturing of both nasal bones where only one is fractured, and this instrument is admirably adapted to that purpose. However, it sometimes requires a tap with the mallet.

Recent lineal fractures when once reduced will frequently stay put, but comminuted and some lineal fractures require support. It is therefore safest to support them all. Enough harness has been invented and used for this to go far toward harnessing Niagara Falls. Most appliances are too cumbersome and troublesome to be useful. The retentive apparatus that is the most simple and successful is the best.

Lee Cohen packs the vestibules and anterior chambers with a half inch strip of iodoform gauze and places on the outside a copper splint shaped to the nose and held in place by adhesive straps. The packing is changed every third day and splint removed every fourth day and skin cleansed with alcohol. The packing is continued about ten days and

the splint four weeks. The splint he copied from Jno. O. Roe, who used inside the nose, a spring controlled by a set screw. The ventilation and drainage of the nose is only slightly interfered with when the spring is used and the tension can be regulated by the set screw.

DISCUSSION

William P. Drake, Bowling Green: I think the essayist should be congratulated on his splendid presentation. The subject of nasal fracture has been very much neglected even in our own line of work. When we see fractures of the nasal or facial bones we often have difficulty in deciding how best to treat them to produce a satisfactory cosmetic result. The patient will forget a fractured bone and the pain it has caused, but he does not forget the deformity which sometimes occurs in these cases. As a rule, general surgeons and general practitioners see these patients before the rhinologist does, they look at the facial deformity and a great many times overlook nasal fracture. Two or three weeks later the patient visits the surgeon or physician and says he does not breathe through his nose properly, and is then referred to the rhinologist who discovers a fracture of the nasal bones or septum which should have been given proper attention when the patient was first seen. There should be greater co-operation between the surgeon, the general practitioner and the rhinologist along this line.

In the type of cases mentioned by Dr. Beck as a rule there is a fracture simple in character and confined to the nose, but this is not always true. There may be a fracture of the malar bone or the superior maxillary, and when we find that type of fracture the difficulty of treatment is increased.

We generally do not see these patients until after considerable swelling has occurred and it is then difficult to make the diagnosis clinically. Roentgenograms should be made in all cases. Most nasal fractures are sustained in automobile accidents, and not infrequently the fracture extends into the maxillary sinus. We should not only make an x-ray picture of the fracture site, but by all means we should determine the alignment of the teeth and see just what deformity the patient has. If there is a fracture of the superior maxillary bone including some of the alveoli, I think we should have consultation with someone who is more familiar than we are with the type of splint that will bring the parts in proper alignment. The fractures I have seen of this type have been mostly in football players. It is important that we see these patients early. In the majority of cases coming under my observation in football players the fracture was confined to the nasal bones. We can reduce these fractures under general anesthesia if it seems advisable, but in my opinion a general anesthetic is not always necessary for the re-

duction of a simple nasal fracture. I am aware that Lee Cohen says a general anesthetic should always be used. As a rule, nasal fracture can be very well reduced under local anesthesia. Nasal fractures generally "stay put" after reduction without the use of any fixation appliances, other than that used for a septum operation. I spent a long time perfecting a copper splint for the outside of the nose, but have seldom used it. There is no need for traction or extension as in fractures of the long bones. In nasal fractures if the bones are properly approximated and a suitable dressing applied they will "stay put." Where there is fracture of the malar bone, or the bone is driven into the maxillary sinus as sometimes happens, I think it is better to operate on the maxillary sinus at the time the fracture is reduced. The malar bone is pushed upward, fragments if present are removed, the maxillary sinus is drained, and the malar bone replaced. Good results are secured in that way. Not long ago a general surgeon referred to me a patient with fracture of the malar bone, which he had reduced. Within two weeks the patient had a marked infection of the maxillary sinus, which had to be opened and drained. It would have been much better if the maxillary sinus had been drained at the time the fracture was reduced.

In cases where the teeth are involved it is sometimes difficult to decide just what is necessary to produce a good result. I recently saw a young woman who in an automobile accident sustained a fracture of the malar bone with displacement of several teeth. An adhesive plaster was applied and the teeth wired in place. A very good result was obtained.

For the simple type of fractures of the nasal bone I think the best method is to accomplish reduction and then apply the simplest form of dressing possible. I have found adhesive plaster with collodion much more serviceable than splints of aluminum, copper, etc.

I thank Dr. Beck for bringing this subject before the section for discussion.

A. L. Bass, Louisville: The subject of nasal fracture is very interesting. Dr. Beck in the first paragraph of his paper mentioned one of the most important factors, that is neglect or improper treatment by the physician or surgeon who sees these patients first, the outside of the nose is examined and a strip of adhesive plaster applied, but the inside of the nose is not inspected. We see them later complaining about being unable to breathe through the nose, and have to perform turbinectomy or other complicated operation which could have been avoided had the nasal fracture been properly reduced at time of the injury. If the rhinologist could see these patients early and reduce the fracture properly before swelling occurred, the results would be infinitely better. I use a Killian speculum to adjust the nasal bones, and this instrument is also helpful in restoring alignment of the septum. If the

septum is pushed backward on itself, as sometimes happens in nasal fractures, proper adjustment can be made with mouse tooth forceps. The Adams forceps which Dr. Beck mentioned is valuable for elevating the nasal bones. By intranasal and extranasal manipulations every nasal fracture can be properly reduced. If more than thirty-six hours have elapsed since the injury and considerable swelling has occurred, or there is a complicating fracture of the skull or something else, we are justified in not doing any immediate repair work, we can apply a proper dressing and allow the tissues to regain their normal condition, then as soon as possible afterward, complete the work under local or general anesthesia. In cases where immediate repair is made, it is only necessary to give the patient an hypodermatic injection of morphine or scopolamine. The tissues are generally numb for some time after the injury, and not much local anesthesia is required. When the patient is not seen early and there is considerable swelling, I believe it is better to wait a few days until the swelling has subsided and then adjust the fracture and take any other steps that may be necessary.

If there is much hemorrhage, its control is important as stated by Dr. Beck. In such cases the tissues can be replaced as nearly as possible in proper position and an intranasal splint introduced to produce slight pressure. The splint is allowed to remain in the nose twenty-four to thirty-six hours and is then removed. When outside splints are required a plaster of Paris mould or copper plate may be used. This is sometimes of advantage to keep the patient from interfering with the nose. After four or five days the external splint may be removed. The patient should be instructed to wipe downward on his nose when using a handkerchief and not twist the organ from side to side, and to handle the nose gently for three to five weeks.

Another feature of importance, although I do not know that it has been mentioned anywhere, is if the injury was sustained while the individual was working around a stable, he should be given a prophylactic dose of anti-tetanic serum. I have knowledge of one such injury, where the patient developed tetanus a short time afterward with fatal result.

S. B. Marks, Lexington: The more I see of nasal fractures the less apparatus I use in their treatment. The method that has given me the best results is the argyrol gauze pack which is left in place for about thirty-six hours after over-correction of the nasal bones. We know the tendency of nasal fractures to cause buckling of the ethmoid. In some instances I have had to fracture the ethmoid plate to overcome this buckling. The packing is introduced high in the nasal cavity leaving the floor free. In this way there is very little interference with breathing. Within forty-eight hours I begin to mould the

bones in position with the thumb and fingers and continue until there is slight or no over-correction. It is surprising how easily this can be done without much discomfort to the patient. The patient is instructed to return for repacking if necessary and remoulding every day for a period of two weeks, then every other day until he is well. I have seldom used any form of external splint in fracture of the nose. Since adopting the plan of over-correcting the fractures and the use of moulding I have gotten much better results.

Walter Dean, Louisville: Dr. Beck's paper is very opportune. Unfortunately we see most of these fractures weeks and years too late. Most of them have received no care whatever, according to the history, or at most a perfunctory strap of adhesive plaster across the nose. I do not mean that we should have any monopoly on the work. Any physician can replace the bones by finger manipulation and sustain them by a starch or plaster dressing externally and gauze strip packed high internally. But he rarely does anything so simple because he thinks he requires paraphernalia he hasn't got. We have a special function in cases where the septum is fractured, with a hematoma dissecting off the mucous membrane and filling the nose. Most of these are compound fractures and the hematoma tends to become infected. If the infected material is not promptly evacuated, the cartilage will be destroyed, causing external nasal deformity.

H. G. Reynolds, Paducah: Dr. Beck has presented a most interesting paper on an important subject, which, as he says, has been woefully neglected by the general profession. I agree with the other speakers that no extensive apparatus is required for repairing fractures of the nose under ordinary circumstances, provided patients are seen early. Where considerable time has elapsed between the injury and repair, conditions may be quite different, as illustrated by the following case: A short time ago I was talking to a friend of mine, who told me of a very prominent doctor who had been injured in an automobile accident some weeks previously and had been under the care of a very prominent surgeon who had examined him carefully for bruised arms and other injuries. A slight abrasion of the nose was noticed at the time but no particular attention paid to it. After the acute part of this man's experience was over he noticed that he was not able to breathe freely through the nose. An examination by my friend disclosed the fact that the man had a fractured nose and his only chance for relief was a submucous resection to be done at a later time.

I merely mentioned the foregoing to show that some general surgeons are likely to overlook nasal fractures and to emphasize the fact that we should call the attention of all physicians that such things are possible in all injuries and accidents, particularly where the person injured

receives a bruise or injury in more than one part of the body. In this case, the one injured, who was a physician himself, was unaware of the fracture, his attention and also that of the surgeon being focused on other and apparently more serious injuries.

Edmond D. Wells, Louisville: I did not hear Dr. Beck's paper, but there is one feature I would like to mention in connection with the treatment of fracture of the nose, and that is proper surgical drainage. Another important item is adequate ventilation of the nose.

I have secured better results in these cases since I began using what is known as menthol packing. Strips of gauze are saturated with a solution of alcohol and olive oil containing three per cent menthol. This solution is thoroughly stirred and the gauze strips saturated with it before the nose is packed. The alcohol drains out of the gauze within two or three hours leaving the olive oil and menthol. The menthol has a tendency to soften the viscid material in the nose and the patient complains less of the packing because proper ventilation is also secured. With this type of packing the patient remains comfortable, and at the same time it affords the proper amount of pressure.

THE ETIOLOGY AND TREATMENT OF PHLYCTENULAR KERATO-CON- JUNCTIVITIS*

By FRANK W. PIRKEY, Louisville.

Phlyctenular kerato-conjunctivitis is a disease with which we are all familiar in our daily practice. Especially is this true in our clinical practice where we see all too often the poorly nourished, poorly developed child with its eyes hidden from the light, crying at any attempt at examination. Usually, too, the child is dirty in the face and wears dirty clothes. The mother also will present this general appearance of lack of cleanliness and of wretched circumstances.

When we finally open the swollen lids we may find different stages of the disease. The photophobia and lachrimation are almost constant. We may find one or more localized elevations in the conjunctiva near the limbus, one or more localized ulcers of the cornea at the limbus, or there may be a generalized, grayish infiltration of the cornea covering a considerable area. Or we may have more severe corneal ulcers, either serpiginous or perforated, with certainty of impaired vision. Phlyctenules differ from other inflammatory processes of the conjunctiva in that they are limited to a localized area and are not diffuse. But the appearance of these lesions is too well known to all of you to dwell on their description.

In our simpler cases we may use which ever

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local remedies the patient may need and in a short time the ulceration will disappear and the eye will appear normal again. But the discouraging fact is that in a few weeks or a few months the patient will be back with some form of the same condition.

Phlyctenular disease is an important lesion of childhood because it is one of the most common. Blair, of Pittsburgh, states that in his clinic these cases will make up about two per cent of the total number of cases, and I believe that in other clinics in large cities the number will run about the same. In the Louisville City Hospital Clinic I believe that the number will run fully this high if not higher, though I have not been able to obtain the exact figures. It is also second to ophthalmia neonatorum as a cause of blindness in children. So I believe it will be worth our while to discuss the etiology of this condition, as there seems to be no definite general agreement as to exactly what the etiology is.

Some authors speak of phlyctenular conjunctivitis when the lesion is in the conjunctiva, and phlyctenular keratitis when the lesion is in the cornea. However, this is merely dividing the disease into two parts on account of the location, as it is all the same disease. In fact, we frequently see in the same eye phlyctenules in the conjunctiva, at the limbus, and in the cornea at one and the same time. As Duane says, in this way a disease which is a perfect unit clinically speaking is torn in two for the love of system.

Pathological investigations have not yet thrown much light on the question of the etiology of the disease. Smears and scrapings of the phlyctenules have not shown any organism which might be held accountable for the condition. Though there are one or two unaccepted reports of tubercle bacillus being found in the lesion, animal inoculations from these lesions have been negative. Sections of eyes in which the lesions have occurred have not shown any definite proof of a causative agent, though the phlyctenules do somewhat resemble a tubercle in structure.

Nor does animal experimental work give any definite light on the subject conclusive enough for absolute proof. Finnoff, in his series of injections of rabbits, first with live tubercle bacilli and later with dead tubercle bacilli, was able to produce in the majority of his animals typical tubercular lesions of the chorioid and of other structures of the eye. However, in only one instance was there developed a phlyctenule. This is not enough to warrant any conclusions.

So that we are left largely to fall back on our clinical investigations and conclusions as to the nature of this disease.

For a long time there has been noticed a relationship between this disease and tuberculosis. The scrofulous diathesis, as it is

called, occurs often with our phlyctenulosis. This would explain it so simply if we could let it go at that. Back in the times before Koch discovered the tubercle bacillus, in 1882, various diseases were called scrofulous. The suppurative glands of the neck which broke down and drained were called scrofulous. Then there was scrofula of the face and scrofula of the joints. In those days phlyctenulosis of the eyes was called scrofula of the eyes because it was noticed that so often it was associated with the other lesions of scrofula. This made matters very simple. Life for the doctor in those days was simpler when it came to diagnosis. There were such good old diseases as typho-malaria and brain fever, which explained many a condition to the satisfaction of all. After the discovery of the causative agent of tuberculosis, phlyctenulosis was regarded as a disease unto itself, but the fact remains that we still have the same clinical relationship between phlyctenulosis and other so-called scrofulous conditions.

In the first place, phlyctenulosis is observed as, are the other scrofulides, in the young—from one to fifteen. It is associated with poor development, with filth and with poor hygienic surroundings. It usually has as a background a faulty diet and a lack of fresh air. It is a disease of the sun-starved of the cities.

With this in mind there has long been a suspicion and a belief on the part of many that the causative factor is tuberculosis. Work with tuberculin seems to substantiate this theory. The tuberculin test is still a subject for argument as to its accuracy, and while it is not infallible proof of anything it is generally considered good corroborative evidence when taken along with other diagnostic findings. In several series of injections made on children routinely and on children having a phlyctenular eye condition, the positive reactions, in those with phlyctenulosis are uniformly higher than in those who have not. This is not proof positive of the etiology but would seem to be worthy of careful consideration.

Now as we have these cases so uniformly from poor surroundings, there is also reason to the argument that it is the poor hygienic surroundings themselves which are responsible for the disease, as are these surroundings responsible for the tuberculosis. Some argue that phlyctenulosis and tuberculosis go together so often because the same surroundings will produce either. Whichever the case may be, there is undoubtedly a close relationship between phlyctenulosis, poor hygienic surroundings and tuberculosis.

Some claim that the disease is caused by excessive eating of carbohydrates, especially candy and sweets. Signorina Elchnig and Colombo claim that it is caused by the absorp-

tion of indol from excessive sugars. There seems to be no direct proof of this, but these patients do respond and begin to improve when they are placed on a diet of plain food and the use of sugar is stopped.

A. B. Marfan reports some interesting experiences in the *Presse Medicale* of September, 1928. At the time that the Von-Pirquet test was first being extensively used, it was noticed that there was quite a reaction of the conjunctiva in some cases when tuberculin was dropped in the eye. So from this observation it was suggested that the reaction be tried by dropping the tuberculin in the eye instead of using it hypodermatically. So Marfan decided to try a series of these cases, but he says that he very promptly stopped as four of his children showed a tubercular reaction which persisted for several months. These lesions were very typical of phlyctenulosis and for this reason he regards phlyctenulosis as definitely tubercular. M. Weeters has produced phlyctenulosis in rabbits by injection and he considers this proof of the nature of the etiologic factor. All of these facts seem to point to tuberculosis as the etiologic factor, though we are not justified as accepting this as a fact. Tooke, of Montreal, takes the view that it is wholly due to poor hygiene, and in addition to the other hygienic factors mentions decayed teeth, infected tonsils, intestinal absorption of poisons. He says ignorance and the slum are the prime etiologic factors, other factors, of which tuberculosis is only one of many, follow in their wake.

And so we come to the treatment of this disease of which the etiology is still in doubt. Some very competent men take the view that it is tubercular, others that it is not.

The local treatment we need only mention. The use of calomel powder or yellow oxide of mercury in the milder stages, when there is no involvement of the cornea, is the old stand-by. When there is a very inflamed eye and corneal ulcers we use, of course, atropin and something soothing. The general treatment is the important matter.

Correction of the diet, cleanliness, fresh air and sunshine are the prime essentials. These measures are agreed as advisable by all, no matter what are their views as to the etiology. And so often, unfortunately, these are just the treatments that the patients are unable to take on account of their financial condition. Duke-Elder has reported good results from using the quartz lamp on these patients, and this certainly seems a logical treatment to supplement the fresh air therapy on cloudy days.

I, personally, believe that tuberculin is a valuable aid in these conditions and that a tuberculin reaction is advisable in these cases. Of course, these patients should have a thorough-chest examination before this is done

that there may be no danger of relighting some other focus of the disease. In our treatment of these cases in the City Hospital we give them local treatment and then refer them to the Tuberculosis Clinic. Here we get very fine co-operation and the child is examined and x-rays are made and whatever other tests are needed. We also have their tonsils and adenoids and teeth examined and in fact try to give them as complete a "going over" as possible. Then if there is no contra-indication, the patient is placed on tuberculin treatment.

Conclusions: While there is no definite proof of the specific nature of phlyctenulosis, I believe that clinical evidence and experimentations strongly support the theory of its tubercular origin.

REPORT OF UNUSUAL EYE CASE, TRAUMATIC CORECTOPIA*

By R. M. ARMSTRONG, M. D., Lexington.

Congenital corectopia is an abnormal position of the pupil. Often the pupil is found slightly excentric, but marked displacement is very rare and is usually an accompaniment of ectropia lentis. The displaced pupil is often, small, irregularly circular or slit shaped and inactive.

E. W.,—white, male, aged 18, a highly nervous individual, came to our office April 9, 1929, giving history as follows:

Up to six years of age had no trouble with eyes. At this age was hit in (O.S.), left eye by rock tossed by a playmate. Just what happened to eye at that time could not be learned, except that he was in a hospital for two weeks and at that time was dismissed with light perception only (O. S.). After twelve years vision began to return and at time of examination of patient he could outline objects clearly in the room. For the past four months he had complained of being able to see two distinct or different objects, (not diplopia), but a tendency to fall to left, walking double, sleeping double, in fact two beings. He also complained of frontal and occipital headache and constant tenseness in throat, or as he described it, a choking sensation.

Examination of right eye, (O. D.), revealed a normal eye, vision 20-20. Examination of left eye, (O. S.), revealed a well rounded pupil of normal size at external or temporo-sclero-corneal limbus, bound down at outer margin in such a way that iris appeared to be absent. Iris reaction on inner margin or nasalward perfectly normal. A slight ptosis of upper lid was present.

Conjunctiva, sclera, and cornea normal.

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Anterior chamber a bit shallower than normal. Purkinje-Sanson test showed an absence of lens. Lens cortex evidently had been ruptured by blow and had been absorbed, except a small portion of cortex just beneath pupil at temporal side.

Fundus examination—vitreous hazy, disc margin indistinct, vessels appeared to be smaller than normal.

Due to highly nervous state of patient we decided to do an iridectomy under general anaesthetic, with pupil thoroughly dilated. A small corneal incision was made with a small keratome in region of 9 to 12 o'clock and iris was grasped at inner margin of pupil and was pulled well out of incision and excised, April 16, 1929.

The patient was allowed to leave the hospital after twenty four hours, a light dressing being worn over the eye. Atropia sulph, 1% solution was instilled daily for a period of ten days and after three weeks the patient was able to read test type on Snellen card and count fingers at ten feet. His distressing, annoying, double life and choking sensation have practically disappeared.

Our diagnosis was traumatic corectopia.

DISCUSSION

J. A. Stucky, Lexington: I have obtained best results in phlyctenular cases with the injection of sterile milk, giving from 3 to 5 c. c. daily for three days if possible, if not, at least every two or three days. I improve the hygienic condition of these children, keep them in the open air as much as possible, regulate the diet, give them food containing a large percentage of vitamin A, B and D, with cod liver oil and concentrated brewers yeast, which is prepared under the trade name of Vegex, or Savitae. Under this plan of management they rapidly improve. The reason we find these cases in the slums is because their hygienic surroundings are so unsatisfactory, they are undernourished, dirty and underfed. I am opposed to allowing these children to eat sugar, candies or pastries, etc. Much of our food is devitalized and does not furnish proper nourishment. We eat too much sugar. There was a good editorial on this subject in a recent issue of the Journal A. M. A. If we could use old fashioned brown sugar, honey or malt sugar these would be valuable in the treatment of cases of phlyctenulosis.

Referring to Dr. Armstrong's case, there is one point I think most of you failed to appreciate. The reason he secured such a splendid result is that he did not do too much. In the iridectomy, only the upper border of the oval aperture in the iris was removed and to my surprise the next day the result was perfect. The patient no longer has double vision, has good sight and the cosmetic effect is all that could be desired.

R. H. Cowley, Berea: I hoped the discussion would not be terminated without something being

said about tuberculin in the treatment of phlyctenulosis. Such cases as I have had have all, so far as I knew, yielded to tuberculin treatment. I think the secret of success in the tuberculin treatment lies in using it carefully and over a long period of time. If we expect to get results from the use of tuberculin as we do from using diphtheria anti-toxin we are going to be disappointed. In using tuberculin in these cases I always start with 1-10,000,000 milligram, which is a small dose, still it guards one against the possibility of doing harm. I double the dose every time and make the intervals five days. It takes a long time to get the dose to one milligram which is as far as I go. If you will try this plan following the technique described, giving tuberculin every five days and making the maximum dose one milligram, I think you will be very well pleased with the treatment. I suppose it is being used in a great many clinics and for that reason I hope we will hear more definite reports from men who have tried it. There is no question about the value of tuberculin in tuberculosis if used in the right kind of cases. If it is given to patients who have a high temperature you will have trouble, but if used in cases without fever it will have good effect.

So far as diet is concerned in phlyctenulosis, my experience is rather limited. I think it is questionable whether sugar and other sweets should be eliminated from the diet. These cases are all tuberculous, at least I have never seen one that did not have a family history of tuberculosis, and we know in this disease a liberal diet is necessary. The administration of cod liver oil and regulation of the diet may be beneficial, but my experience does not extend over a sufficient length of time to make my opinion worth anything. The patients I see come from the mountains of Kentucky, where regulation of diet would be a difficult matter in any event.

Frank W. Pirkey, (in closing): I wish to thank the gentlemen for their discussion. I was very glad to hear what Dr. Wiener had to say about the use of sugar. It is almost impossible to get a child to entirely quit the use of sugar, and in the light of our present knowledge there seems no reason to forbid the use of sweets as long as they are not used to excess.

As to syphilis, I do not believe that there is any relationship between phlyctenulosis and syphilis, though, of course, the two do frequently occur together.

Protection Against Light by Irradiated Albumin Solutions.—Hausmann and Spiegel-Adolf have observed a decided protection against the erythemia and hemolysis produced by the rays from a mercury vapor lamp when irradiated albumin solutions were used as a filter.

CHRONIC SUPPURATIVE OTITIS MEDIA — CLASSIFICATION AND TREATMENT*

By W. A. POOLE, M. D., Lexington.

It is not the purpose of this paper to add anything to the abundant amount of material already available on the usual aspects of suppurative otitis media, but rather to present some observations made in a series of 850 cases, with roentgen-ray examination of mastoids in every case.

The three common types of suppurative otitis are well described by Ballenger as follows:

1. "The symptoms in the latent form of middle ear suppuration are scarcely appreciable to the patient, as there is little discharge and no pain or tenderness over the mastoid process. The patient often says there is no discharge, nor has there been for many months or years. Ocular inspection, however, will often show a small amount of pus in the middle ear and external auditory meatus. The amount is so small that it does not reach the conehea, but is evaporated in the meatus, the dried remains being thrown off with the cerumen and epidermis. In these cases there is a central perforation of the drumhead, the size varying from a millet seed to almost the entire membrane, though frequently cases of latent otorrhea are observed in which the perforation is marginal.

2. "In the chronic discharging form there is a profuse but intermittent purulent discharge, sometimes admixed with mucus and blood. Acute coryza, epipharyngitis, and exposure to inclement weather increases the amount of discharge and its purulency. Pain may be present, especially when aggravated by either of the foregoing conditions. There is, at these times, a slight tenderness over the mastoid process, especially over the antrum. Inspection of the fundus meati shows pus completely filling it or oozing through the perforation in the drumhead. If the drumhead is largely destroyed, and the pus has its origin in the attic, it may be seen to trickle down the long process of the incus into the atrium of the middle ear. After removing all the pus from the middle ear, the promontory appears as a yellowish-red reflex. There is more or less elevation of temperature during the subacute exacerbations.

3. "Chronic otorrhea with acute exacerbations attracts attention on account of the exacerbations of pronounced pain, mastoid tenderness, and elevation of temperature. The patient and attending physician become conscious of the danger which may have existed for some weeks, months, or even years pre-

viously. What previously was regarded as a simple, harmless discharge is now recognized as a threatened mastoiditis. There is a profuse flow of pus, perhaps admixed with blood, the mastoid is tender to the touch, either at its tip or over the antrum, and the temperature ranges from 1 degree to 4 degrees above normal."

As the patients have been examined at intervals varying from a few weeks to a year, it has been impossible in many cases to distinguish the types by inspection of the drumhead or middle ear. The latent form may have a marginal perforation or almost complete destruction of the drum membrane at time of examination, while in chronic otorrhea with exacerbations the drum membrane may present the same general appearance or probably have no perforation at all. If the middle ear is visible at time of examination there may be such similarity in appearance that one cannot distinguish the simplest from the most severe form of suppurative otitis media, by inspection. In such cases it is necessary to rely largely upon the patient's statement, or find some other means of ascertaining the true condition.

In an effort to find some definite rule for differentiation, the patients were sent to the laboratory for roentgen-ray examination of the mastoids. Dr. J. C. Lewis, Roentgenologist, and Mr. Paul Bradley, Technician, developed a technique that has proven very satisfactory. Eight hundred and fifty (850) cases have been studied with the following results:

Suppurative otitis media, mastoid involvement	470
Suppurative otitis media, no mastoid involvement	314
History of repeated attacks of suppurative otitis media, but not discharging at time of examination—mastoid involvement	17
History of repeated attacks of suppurative otitis media, but not discharging at time of examination—no mastoid involvement	49

The patients were not selected, but examined routinely as they presented themselves at the clinic, nearly fifty-eight per cent of all cases showed mastoid trouble.

Some interesting observations made: Latent cases never showed changes. Chronic discharging forms showed mastoid involvement in sixty per cent of the cases. This group included many tubercular cases, only two (2) of which showed any marked changes in mastoid cells. Chronic otorrhea with acute exacerbations showed mastoid involvement in ninety-two per cent of all cases.

Classification into the three forms was made somewhat arbitrarily, usually based upon repeated examinations and histories ob-

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tained from the patients and their folders. With such large number of cases showing mastoid involvement, it is believed that they should be added to the Baillinger group as type four.

Early in the investigation the advisability of surgical treatment was not seriously considered and blood counts were not made in all cases. Those that were examined showed no changes in the blood count that could not reasonably be accounted for by the patients' other disabilities. The exceptions being three cases of acute exacerbation with definite mastoid symptoms, in which there was a mild leucocytosis with eighty, eighty-four and eighty-seven per cent polymorphonuclears respectively.

Various methods of treatment were used both in and out of hospitals, and the following conclusions reached:

The new antiseptics gave no better results than the old.

The old treatment proving most satisfactory in the majority of cases being the instillation of alcohol or ether after thorough cleansing with phenol-boric-acid solution.

The dyes were not used extensively but results were disappointing.

Diathermy seemed unsatisfactory, but was not altogether condemned as it was not much used. On account of the low amperage required, the question arose as to whether the average machine was delicate enough to be safe, and whether a difference in individual patients caused such varying degrees of vertigo, head noises, etc. Another reason for hesitating was the varying degrees of density of the structures of the head, the extreme delicacy of some of the tissues, and the absence of an authoritative report on the effects of high temperatures on such tissues.

Surgical diathermy was used in a few cases and was thought to serve a more definite purpose, but could never replace a clean surgical operation where one could see just what was being removed and what left.

Treatments by ionization of zinc and copper were tried and abandoned, largely because of the pain and discomfort of the patient, perhaps due to a faulty technique or too coarse adjustment of the galvanic generator.

Light, especially the infra-red rays were used on several cases without mastoid involvement, and seemed to help some, but here again was urged the necessity of x-raying the mastoid before applying the heat rays to any ear.

A comparatively few cases had interval mastoid operations but so far as known the results were uniformly good, some cases having been watched for three years without any return of middle ear trouble.

Pending further investigation when repeated blood examinations and other import-

ant facts may be checked with the x-ray findings, the questions that now present themselves and that suggested this discussion are:

Is mastoid operation ever indicated as a treatment for chronic suppurative otitis media.

What are the specific indications for such operation.

When should the operation be done.

Many members of the profession have advocated mastoid operation in certain cases of chronic purulent otitis media, among them J. H. Foster, who stated, "The radical operation is indicated and should be done with the assurance of a good result." While the profession has not generally adopted the practice, the observations here lead to the belief that such procedure would afford much relief in many cases. It is also believed the interval operation is just as important in chronic otorrhea with exacerbations as it is in chronic appendicitis.

SUMMARY

A large number of cases considered simple were found to have mastoid involvement, causing a belief that an x-ray study should be made of all cases of chronic purulent otorrhea.

It is believed that cases showing mastoid involvement should be classed separately and further study made.

Tubercular cases rarely showed evidences of mastoid disease.

No specific remedy was found. Tried under similar conditions, the newer antiseptics gave little, if any, better results than the older remedies.

Diathermy, ionization and other electrical treatments are believed to be of value in many cases when given by experts who possess the proper equipment, but in the hands of novices may do irreparable damage.

The value of light therapy alone appears to be very limited.

Skillful surgery still holds first place in removal of diseased tissues.

Diseased mastoid cells should be removed during a period of quiescence.

The discussion of treatments may seem pessimistic, but the structures involved are so important, and great harm might so easily be done by some new device unskillfully used that it seems well to remember the old adage, "Be not the first by whom the new is tried, nor yet the last to lay the old aside."

Diuretic Action of Bile Acids.—Lebermann has found bile acids to be valuable diuretics in cases of oliguria and edema resulting from decompensated heart lesions.

A FEW THOUGHTS ON CHRONIC SUPPURATIVE OTITIS MEDIA*

By G. W. WHITE, M. D., Henderson.

By chronic suppurative otitis media we mean an inflammation of the middle ear, characterized by a purulent discharge which has continued over a period of months and sometimes years. The discharge may be continuous or may be intermittent but there is always a pathological change in the middle ear whether there is discharge or not.

Etiology: The acute process in the adult has a tendency to get well so that the majority of cases of chronic suppurative conditions arise in childhood.

We are apt to find inflammatory conditions in the nasopharynx which recur at frequent intervals and this is particularly so if the tonsils and adenoids have not been removed. The chronic condition of the middle ear is almost the result of neglect of the acute condition. The local conditions of the ear itself or the general condition of the patient has not been properly taken care of. One frequently sees cases in which the mastoid bone has been involved in the acute process. The acute mastoid symptoms have subsided but the discharge from the middle ear continues to be profuse much more than would result from the middle ear infection. This discharge is allowed to go on for months or years until actual and serious bone changes take place both in middle ear and mastoid bone.

The exciting cause of all suppurative conditions of the middle ear is bacterial invasion. The bacteria which cause the acute condition may be the cause of the chronic; in the majority of cases, however, the original infecting bacteria have become attenuated or have lost their virulence until a subacute process results which in time turns into a chronic process. The original bacteria may be overcome by bacteria of different characters which gain predominance, the result being a mixed infection in which bacteria, like the colon bacillus or the proteus bacillus predominate. These latter bacteria usually give off a characteristic odor which is aggravated by the odor arising from necrosis of the bone. The conditions one frequently finds at the operation for chronic disease justify the opinion that most of these conditions have a mastoid involvement with the middle ear. As to the discharge, three distinct types may be noted.

1. The mucoid. 2. The purulent with odor. 3. The cholesteatomatous.

In many cases, and especially so in children, the discharge contains more mucus than pus.

A careful examination of the nasopharynx and pharynx will frequently show diseased tonsils and adenoids and sometimes sinus diseases. This type will subside rapidly after the nose and throat conditions are treated properly.

The discharge with odor: The majority of cases fall into this class. In fact one of the first symptoms that brings the patient to the doctor is the anxiety caused by the odor from his ear. This pus is very irritating to the lining membrane of the canal and often will result in eczema of the canal. There is usually extensive destruction of the drum. Sometimes the entire membrane is destroyed.

It is often possible to get a good view of the middle ear cavity and get an idea how much bone destruction has taken place, one or more ossicles may have been destroyed so that all one sees is the foot plate of the stapes lodged in the oval window. The amount and character of the discharge will depend upon the character of the organism and the amount of necrosis which is present. How far the bone necrosis extends it is impossible to say and sometimes the severity of the condition is only discovered at the operation.

As to the cholesteatomatous: After the suppuration from the ear has gone on for an indefinite length of time certain changes take place in the bone which result in cholesteatomatous degeneration. Whenever cholesteatomatous tissue is found one should realize that the pathological condition has gone beyond repair by the ordinary treatment and that operation is imperative in order to prevent the destruction from extending to the vital parts. Cholesteatomatous discharge can be differentiated from other discharges both by macroscopic and examination under microscope. The discharge is cheesy, like thick cheese and has a nauseating, foul, sour odor which differs decidedly from that found in other conditions. A small amount of it should be placed on a slide and examined under a microscope when one can see fat globules and crystals of cholesterol. Other than the discharge there are seldom any symptoms, except perhaps an itching of the canal, until some complicating process occurs or unless there is some clogging of pus. A chronic discharging ear is always a dangerous ear and often certain warnings of nature indicate that the process is relighting and that the patient is in danger.

One of the first warnings is an indefinite pain deep in the ear with repeated headaches. The process may have extended to other parts, such as the dura or sigmoid sinus. There is seldom any fever and seldom any pain in the mastoid process or tenderness over it. If dizziness occurs one should be at once on the lookout for possible extension to the

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labyrinth or cerebellum. The exact condition present must be determined in almost every instance by the objective examination of the middle ear and therefore attention to the following points is necessary.

1. Degree of impaired hearing.
2. Condition of the drum membrane.
3. Patency of the eustachian tube.
4. Character of the pathological changes in the middle ear, attic, antrum and mastoid.
5. Amount of bone necrosis and cholesteatomata.

As to impaired hearing. In almost every instance the hearing is more or less impaired. Tests of hearing acuity should be made in every case. The importance of determining the amount of hearing rests in the fact that one should not increase the hearing defect by operation. Where the other ear is normal, one sometimes feels that it is safer to resort to operative procedures, even with the prospect that the hearing will become more impaired, because the amount of bone destruction may have gone on to a stage that a suspicion that vital parts are exposed. But if the hearing in the other ear is impaired one has to be extremely careful not to resort to too radical procedures to cure the condition.

As to drum membrane. The degree of destruction of the drum will depend upon the length of time the suppuration has gone on and the amount of pathological change which has taken place in the middle ear and drum itself. Small perforations are most often seen in connection with a discharge in which there is a great deal of mucus, especially if it is located near the eustachian tube opening. The amount of destruction of the drum is not always an indication of the severity of the lesion, nor is the degree of hearing dependent upon the loss of any or all of the drum. I have seen several cases in which the middle ear has become dry and free from any further trouble when there has been no evidence of any drum whatever. On the contrary I have seen other cases in which only a small perforation existed in which the hearing was practically nil and the pathological process behind the drum of a very serious nature.

As to the eustachian tube. In the majority of cases the tube is open, so that secretion from the throat constantly moistens the ear; at the other times intermittently open so that the ear is sometimes dry and sometimes wet depending on the patency of the tube and the amount of inflammation in it. It is a well known fact that even in the most aggravated cases when the tube is closed the condition within the middle ear will improve rapidly, so in the course of treatment one must keep in mind that the nasopharynx and tube need treatment as well as the ear itself.

As to the character of the pathological

changes in the middle ear, attic and antrum. The pathology in these parts will depend greatly on the length of time the process has continued and the individual resistance of the patient. They vary from simple hypertrophic mucous membrane of the middle ear to extensive destruction of bone, not only the ossicles but the bony walls of the middle ear, attic and antrum and mastoid cells. The condition within the attic cannot often be told by inspection because of the sharp recess of the attic. Palpation must be resorted to, or one may wash out the attic with a small syringe with a hot saline solution. The probe for palpation of the attic should be bent to an obtuse angle and gently inserted, one may feel raw areas of bone which can be determined by the scratching feeling. Washing will sometimes bring out foul smelling pus from the region even when the middle ear seems to be free from pus. The x-ray is a great help in determining the pathology of the mastoid.

As to bone necrosis and cholesteatomatous degeneration. The amount cannot be estimated in any individual case. The extent can often be suspected from the amount and character of pus and its very foul odor. One is never in doubt when necrosis has gone on to the stage where cholesteatomatous material is being discharged. It has been proved time and again that such a discharge is a warning of the dangerousness of the condition and that the ear must be operated on at the earliest opportunity.

DISCUSSION

Gaylord C. Hall, Louisville: I have enjoyed the two papers very much. The subject of chronic otitis media is so vast that we can discuss it only superficially. Both the essayists said the roentgen-ray examination gave them considerable information in chronic otorrhea. Dr. Poole particularly emphasized this, and I would like for him to tell us in closing just how they were able to secure information as to whether or not there was an active involvement of the mastoid cells, or whether the pictures merely showed an obliteration of the cell outlines. My impression has been that in chronic otorrhea roentgen-ray evidence merely states that sclerosis of the mastoid exists. If we could obtain an x-ray report that would differentiate between active and inactive mastoiditis, it would certainly facilitate the treatment very much, and also give us a line on the course to pursue.

Both the essayists treated the subject largely from a clinical standpoint. Regarding the treatment by instillations or irrigations, I would agree that results to be expected in chronic otitis media from either of the methods are likely to be unsatisfactory regardless of the antiseptics used.

I would like to consider the subject from the standpoint of pathology. Chronic middle ear disease may be conveniently divided into three

groups: (1) tube cases, (2) suppuration confined to the attic, and (3) suppuration which has involved the mastoid antrum, in other words chronic mastoiditis.

In tube cases we are apt to have a large perforation which tends to involve the lower anterior portion of the drum. The discharge is mucoid or may be purulent in character if there is an acute exacerbation. There is no odor except in neglected cases and if present quickly clears under treatment. There is no involvement of Shrapnell's membrane and cholesteatoma is not present. These are, in my opinion, non-dangerous cases and they never demand radical mastoid operation. Treatment in these cases should be directed to correction of the pathology present in the nasopharynx, in the nose itself, or in the throat. Such surgical measures as are indicated for relief should be instituted; the general health of the patient should be looked after; infections of the nose and throat should be prevented if possible. Very little is needed except removal of the discharge and the use of antiseptics; but this is not the important feature, the important thing is attention to the general health and treatment of the nose and throat. If in spite of all this the tube remains widely open and symptoms continue, in my opinion it is certainly advisable to attempt closure of the tube by a method such as that devised by Yankauer several years ago. This can be done, but it is not successful in all cases; the tube does not always remain closed, but after a number of months or years if the tube reopens and the discharge recurs the tube may again be closed and this time it may remain closed.

The second type is that in which suppuration is confined to the attic. Here the perforation is generally high, involving Shrapnell's membrane, yet the perforation is usually small. Local treatment directed to the middle ear is not successful; there is a foul discharge that does not clear up; eroded bone can be felt in the attic. It is not always possible to differentiate between this and the third class. These cases are more serious than the first type mentioned, and I think we are well within the line of safety when we attempt to secure relief by operation, which contemplates removal of the diseased ossicles and removal of the outer attic wall. If the tube is widely open this should be closed also. In latent suppurative cases I think this operation may be safely performed. I recall only one instance in which an acute attack of mastoiditis seemed to be precipitated by this operation. I think fully fifty per cent of cases can be cured without resort to radical operation, and certainly if this method fails radical operation may be resorted to later. All middle ear work, including closure of the tube has already been done, and it is only a matter of opening the antrum and removing such cells as can be found, taking down the posterior wall and making a plastic.

In the third type the disease has extended

backward into the mastoid antrum, and this includes latent chronic mastoiditis which is subject to acute exacerbations. These acute exacerbations are especially dangerous in my opinion. I wish to disagree with Dr. Poole in regard to one statement he made, that is the interval operation, in chronic otorrhea with exacerbations. My own judgment would be that if acute labyrinthitis exists it would be well to wait until this subsided before attempting radical operation. But in chronic mastoiditis with an acute exacerbation with symptoms pointing to septic sinus thrombosis, brain abscess, or possibly to meningitis, then it would be dangerous to wait expecting to be able to operate in the interval, because the symptoms are advancing, and further delay in removing the focus would decrease the chances of carrying the case to a successful conclusion.

All these cases that show symptoms pointing to an involvement of the mastoid, or worse, with involvement of the mastoid accompanied by symptoms of involvement of the deeper structures should of course be submitted to a radical mastoid operation.

W. B. McClure, Lexington: Realizing that these papers will be discussed very generally, my remarks will be confined to two features both diagnostic in character. It is very important that we distinguish between two varieties of chronic suppurative otitis media, (1) the dangerous, and (2) the non-dangerous types.

The dangerous variety is that in which the perforation is near the margin of the drum membrane and in which the bones of the middle ear and the bony walls are involved. It is in this class that there most often occurs involvement of the mastoid and intracranial complications, and in which radical mastoid operation becomes necessary.

The non-dangerous variety is where the perforation of the drum membrane is near the center, and where there is still a margin of the drum remaining. In this class of cases the disease usually remains confined to the middle ear and the tube. Rarely or never is radical mastoid operation indicated in this variety of cases. The ear may continue to discharge for years without any deleterious effect on the health of the individual. I have under observation one case in which the disease began twenty-six years ago, the patient having been brought to me following an attack of typhoid fever. I think there has not been a day in the twenty-six years that the patient has not had discharge from her ear, yet she is in perfect physical health with hearing only slightly impaired. I had Dr. Shambaugh see this patient and he advised that nothing be done except local applications, with the assurance that there was no danger in the case.

I call attention to these two varieties in order that we may be saved the embarrassment of useless surgical procedures and that the patient may

be saved the danger of useless operations.

William P. Drake, Bowling Green: Some of the previous speakers have called attention to the importance of preliminary treatment of the nose and throat in cases of chronic otitis media. If there exists any trouble about the nose and throat I think it should be relieved by proper treatment, for in a great many instances this has a very beneficial influence on the otorrhea, most especially in children.

I have secured some good results from the ionization method of treatment. When this is used the patient should be told that improvement may not be permanent, as we know it does not relieve all these cases. I am impressed with the fact that in cases of chronic otorrhea of long standing, especially those with cholesteatoma, there is not much to be done except a radical mastoid operation. I do not believe, however, that the radical operation is always essential in these cases. Personally I have many times performed simple mastoidectomy, enlarging the antrum and attic well, packing the wound and keeping it packed permitting it to heal from the bottom. I have two patients who have remained absolutely well for two years after this simple procedure with no discharge from the ear during that time. I do not mean to say that will cure all these cases, but because of the happy results secured in these two instances I mention them for your consideration. Of course in the presence of labyrinthitis acute in type it is a different story. There are two schools of thought as to what should be done in these cases. If the patient has an acute labyrinthitis, and the temperature suddenly rises to 103° or 104° F., some otologists believe that an immediate radical operation should be performed, and the canal drained. Others believe it is much safer to keep the patient quiet and treat him symptomatically. The claim is made that it is dangerous to perform a radical mastoidectomy, if the patient has, or has had labyrinthitis, without at the same time instituting drainage, because the mastoid operation may cause reactivation of an old focus in the labyrinth with serious results. After sufficient time has elapsed to permit more or less bony formation in the canal, then a radical mastoid operation may be safely performed without at the same time opening the canal.

I recall one patient that came under my care who gave a history of having had a circumscribed labyrinthitis, two years or more before coming to me. Patient was absolutely deaf. Chronic otorrhea, with cholesteatoma. All tests applied to labyrinth proved beyond question it was a dead labyrinth.

Radical mastoid operation was performed without at the same time draining the canal. Patient made uneventful recovery.

H. G. Reynolds, Paducah: There are two things that I want to mention. The first is that

I am certain that the older men present can look backward over their experience and recall the great number of radical mastoid operations that were done a few years ago. Perhaps many of them unwisely and unnecessarily. The other is that Dr. Poole has presented to us a modified classification of the indications for radical mastoidectomy, in which he used roentgen-ray studies in a large series which has proven satisfactory to him and should be quite an addition to our methods of diagnosis in such cases.

It is frequently a question in the minds of all of us in treating a patient with chronic middle ear disease, which fails to respond to ordinary methods of treatment and who has not the classic indications for a radical mastoidectomy, just how safe we are in carrying the patient along from day to day. I do know that we are all doing fewer radical mastoid operations now than we did a few years ago. Dr. Shambaugh's work has led me to believe that we have all done too many radical mastoidectomies and that if we study our cases more closely that we will find fewer cases for the radical operation now than formerly.

Doubtless we all see cases in our routine work that impress on us certain things that we have forgotten. I recall one case particularly that I saw about a year ago, a woman who had a history of ear trouble for twenty-five years, a discharging ear. During that time she had never consulted an otologist. When I was called to see her she could not even sit up in bed she was so dizzy, she was weak and ill but her temperature was normal. There was an abundant discharge from one ear, it was rather foul, and it was evident that she had cholesteatoma. She was taken to the hospital after being convinced that she needed hospital care. After further observation, it became apparent that she had labyrinthitis. There has been no distinction made today by the previous discussers between purulent labyrinthitis and simple labyrinthitis. This woman had labyrinthitis very evidently, but I could not decide whether to operate at once or wait. I could not convince myself that she had a purulent labyrinth, but knew if she had she would not get well. After a few days I concluded she had simple labyrinthitis. A radical operation was performed. She had sinus thrombosis, although at no time did she have a typical sinus thrombosis temperature. The jugular vein was ligated and the involved sinus obliterated. She then developed meningitis, and I suppose brain abscess, and died. The foregoing history extended over a period of four weeks. We are profoundly impressed when we encounter a case of this kind. We know there was a time in the existence of this chronic ear infection when well directed treatment and operation would have saved a life.

Dr. Poole said he had discontinued ionization because it caused the patient so much pain. We

have never caused the patient any pain by ionization, and while it has been fairly satisfactory I do not regard ionization as a cure-all. It is an adjunct to our treatment, that is about all we can say.

I have enjoyed the papers very much.

E. V. Edwards, Mayfield: There is one method of treatment in chronic otitis media which up to this time has not been mentioned and that is the application of radium. About three years ago Dr. G. Allen Robinson of the Manhattan Eye and Ear Infirmary in New York was visiting a member of our staff in Mayfield, and I discussed with him the advisability of using radium in the chronic cases of otitis media with polyp formation. We had a patient at this time that had had a radical operation by Dr. Mathews, of Chicago, on one ear, and a semi-radical of the other ear. It was in this semi-radical operation that the polypi developed causing a good deal of discomfort to the patient with very poor hearing. We inserted into this polypoid area three needles of 10 mgs. each, screened with copper, and treated the patient for one hour. We got very little result from this first treatment and in three months time we made another application of the bare needle for ten minutes. This time there was considerable reaction which promptly cleared up and a splendid result both as to hearing and the disappearance of the polyps. We have had to use the radium in this case one time since then and believe the polyps have practically disappeared. The patient has splendid hearing and at this time no discomfort. We have great hopes that radium is going to be a very useful therapeutic agent in these chronic otitis media cases with polyp formation. We are treating at present two cases in this manner, and hope before the next meeting we will be able to report as good results in the second case as has been accomplished in this first case treated.

It has been our observation that patients with as much as one-half or two-thirds of the tympanic membrane destroyed with a cholesteatomatous mass as having very little hearing. Those with complete destruction of the tympanic membrane have practically no hearing. It is in this type of case that we believe are the most selective type of cases for a complete radical operation.

A. L. Bass, Louisville: Dr. Hail expressed my views thoroughly except in one or two instances. Relative to the value of the x-ray. You know there are two types of mastoids; the pneumatic and the diploic type, in both you have a large cell which is generally posterior to the auditory canal, may be a little lower or higher. In these old chronic discharging ears where nature has practically performed a mastoidectomy for us by causing obliteration of the cells and the x-ray will show what is behind the sclerosed mastoid. In a good many instances where there are exacerbations consisting of pain

in mastoid, pain on pressure, slight elevation of temperature, increase of discharge, the x-ray will show a shadow representing a focus of active infection which is generally the large cell. A modified radical will suffice in this condition; that is, going down through this ivory like cortex to the focus enlarging the antrum, taking down the posterior canal wall considerably but not entirely. It is in this type of case I have found the x-ray of value.

As to the involvement of Shrapnell's membrane and that area solely, I agree with Dr. Hall in his method of handling these cases, save that I would perform the radical mastoid instead of the ossiculectomy. The ossiculectomy is safer in his hands while I feel that the radical operation is safer in mine. When there is a polyp coming from Shrapnell's area or posterior area of drum and the condition is localized to middle ear, no cholesteatoma; removal of the polyp and boric acid alcohol drops will clear up a great many of these cases. On the contrary when there is a polyp or cholesteatoma with bony necrosis, I can't see anything but a radical mastoidectomy that will suffice. The doctor spoke of radium giving satisfactory results in these cases. I hope he will continue his investigations and report to us later. Personally, I am unable to appreciate how he can cure cholesteatoma with radium. If he can I am sure he will have a great many patients to treat.

M. C. Baker, Louisville: I think something further ought to be said concerning the therapeutic management of chronic otitis media. We seem to be prone to resort to surgical treatment before giving therapeutic measures a trial. Excessive carbohydrates and sweets should be interdicted and food given which will raise the vital resistance of the patient. Regulation of diet and proper exercise are important factors.

It is my opinion there is an hereditary taint in these cases, but just what it is I do not know. By investigating the family history it will be found that many patients of the same family are afflicted with certain defects. Many of them are subject to recurrent attacks of otitis media.

Whether there is a luetic taint I do not know, but in children I have seen some very good results from the administration of protiodide of mercury tablets. It is also important to prescribe medicinal agents which will increase elimination through the kidneys.

It seems to me we are often prone to resort to surgery before trying therapeutic measures.

Edmond D. Wells, Louisville: I wish to thank both essayists for their excellent papers. Considerable time must have been spent in their preparation. We have found it difficult at times to get the roentgenologist to give us a positive opinion as to the diagnosis in cases of chronic otitis media associated with chronic mastoiditis. In acute mastoiditis proper diagnosis can usually be made by roentgen-ray examination. The

x-ray man generally says: "There are pathologic changes present in the mastoid, but whether due to a chronic or an acute condition I am not prepared to positively state." The roentgenologist has not been able to help us much in chronic cases.

I would also like to emphasize the importance of having roentgenograms made early in these cases. We have been too prone to treat the patient without x-ray examination so long as he improves. If he becomes worse we then have a roentgen ray examination made. I believe we should have roentgenograms made early in these cases, just as soon as patients come to us, as then we have landmarks for guidance. If the patient returns to us six months or a year later with an acute exacerbation, the x-ray picture previously made may be of great value. We do not co-operate with the roentgenologist as much as we should. By keeping in close touch with him I believe he will eventually be of greater assistance to us in completing the diagnosis.

J. A. Stucky, Lexington: I think in cases of chronic otitis media, especially where there is present a considerable amount of polypoid granulation, ossiectomy may be all that is required; if there is a great amount of bone necrosis the best results are obtained by radical mastoidectomy. I believe we should make the radical mastoid operation the last resort. In chronic cases with extensive eburnation, we have everything to gain and nothing to lose by operative procedure, and we get favorable results in a large percentage of these cases by resorting to surgery.

R. H. Cowley, Berea: I do not recall that anyone has mentioned the ether treatment of chronic otitis media and how the remedy should be applied. This has given me better results than anything I have ever used. The technique is very simple. I first cleanse the ear thoroughly with a cotton-wrapped applicator dipped in peroxide of hydrogen, then take a pledget of cotton saturated with strong cocaine solution and so place it in the ear that it will get into all crevices, and leave it there for ten minutes. Then I have the patient on the table and fill the ear with ether and leave it there until most all evaporated. When the remainder is removed with mop it will be found the ether has dissolved all the debris and brought it into the open.

The next step is to introduce a four per cent solution of mercurochrome, which penetrates all the crevices, the excess being removed with cotton. We get our patients from the mountains of Kentucky, where they have been neglected as a rule, and the treatment described has been the most effective of any I have seen. If they do not improve under this method of treatment, they have necrosed bone or cholesteatomata, and something in the way of operative treatment will have to be done.

W. R. Pryor, Louisville: Dr. Poole asked when

radical mastoidectomy should be performed in chronic otitis media. Neumann has divided the indications into two types, (1) relative, and (2) absolute. Under the relative type he includes chronic otitis media with mild symptoms in which operation is indicated if not today, or tomorrow, at least in the near future. Cases in the absolute group require immediate operation. Under the relative type are grouped cholesteatomata or aural polyps where the patients have failed to respond to treatment within six months or a year. Under the absolute type may be mentioned, first, facial paralysis occurring during chronic otitis media; second, cases with temperature of over 101° F. persisting longer than a day, where all other possible causes for the temperature have been eliminated. A third group embraces intracranial complications, such as brain abscess, sinus thrombosis, labyrinthitis, etc.

Earl C. Yates, Lexington: It seems to me there is still some misunderstanding in regard to performing radical mastoidectomy in chronic otitis media of long duration. Just what valid reasons have been offered for eliminating the radical mastoid operation in these cases? The pathology that is present in chronic cases can seldom be removed without operative treatment. That is one of the most cogent arguments in favor of radical operation. Many of these patients will refuse, for economic reasons, to reappear for conservative treatment for a sufficient length of time to get them well. The economic factor is an important one in the majority of these cases. It is our duty to get the patients well so they can return to work in the shortest possible time, and the only way this can be accomplished is by radical mastoid operation. In advising simple or radical mastoidectomy we must consider the period of morbidity and adopt the plan which will get the patient well so he can return to duty as soon as possible.

Walter Dean, Louisville: Dr. Shambaugh at Crab Orchards Springs meeting made an address we have all remembered in which he said that patients suffering from chronic suppurative otitis media carry dynamite in their heads and that it often goes off. Mortality from ear disease is surprisingly high. In Prof. Bezold's old text book we find that in nine thousand post mortem examinations at Guy's Hospital, one death out of every one hundred and fifty-eight was due to ear disease. American, Vienes and Prussian statistics approximately show the same percentage. Statistically, an interesting point is that almost all the ear deaths occur in the decades between ten and thirty. Korner's statistics show that four to five per cent of all deaths which occur during the healthiest and strongest years of life, that is between ten and thirty years, are due to suppuration of the ears. The reason for this has never been satisfactorily explained. Prob-

ably the reason is that cholesteatoma has not often become very well established much before the tenth year and that in the survivors over forty, the bone holding the septic mass has become so sclerosed that the intracranial tissues are protected. Anyway, cholesteatoma is the "nigger in the wood pile" in ear disease. It is "dynamite in the head." In our domain of ear, nose, throat, no condition is so treacherous as chronic suppurative otitis media complicated by cholesteatoma in acute exacerbation from influenza. In such cases, intracranial complications strike with great rapidity and we must be alert to the very beginning signs of these complications. When discovered, nothing less than an immediate radical mastoid operation is conservative. I always have hopes that an acute mastoiditis will get well by providing perfect drainage through drum opening and I seldom have to do a simple mastoidectomy.

In chronic cases in exacerbation, we can give no such help and can hold no such hope unless we remove the outer mastoid table and throw the mastoid and the middle ear into one cavity. Ossiculectomy is a clever operation which has been outgrown. It is difficult to do, subjects the patient to more risk than a radical mastoidectomy, and may accomplish much or little, or nothing. Unfortunately the roentgenologist can not identify cholesteatoma in the mastoid and in fact can help us very little in chronic mastoiditis which is quite the reverse in acute mastoiditis.

I often wonder why we do not do more radical mastoid operations in intervals. It would be silly to think we fear facial paralysis, etc. It must be that we and our patients are too busy to face the long convalescence, though the convalescence is becoming shorter as we understand the tissues and our problems better.

When Dr. Pirkey was talking about the treatment of phlyctenular corneal disease and Dr. Baker about building up our ear patients, I was thinking about what Dr. Hans Bruner, of the Alexander clinic said to me two years ago, when he was giving us his course in otology in Louisville. He saw about a dozen of my private ear patients, none of them had cholesteatoma, but some of them had resisted thorough treatment over a considerable period. Before he went away he said, "Did you ever stop to think that every one of these patients look bad generally? Build them up." It hadn't occurred to me before what a funny outfit they were. Fully half of them co-operated with their physicians, and me long enough to gain in weight, strength, looks and their ears improved along with the rest of their body.

Just a point about the difference in effect of radical mastoidectomy in adults and children. In my experience hearing is more often improved than impaired in adults. In young children the hearing is improved for awhile but by the time they reach puberty they usually show more or

less nerve deafness. This is due to the inner ear atrophy, the cause of which is not well understood.

W. A. Poole, Lexington, (in closing): I enjoyed Dr. White's paper.

Some who discussed the papers seemed to have understood that I advocated radical mastoid operation in all cases of chronic suppurative otitis media. I did not intend to convey such impression. The purpose was to remove any foci of infection found in the mastoid cells, whether that required a radical, modified radical or some simpler operation.

The interval operation was urged because the work could be done easier and without subjecting the patients to the dangers usually attending an emergency operation. It was well understood that comparatively few patients would submit to an interval mastoid operation, just as a very few sufferers from chronic appendicitis would submit to an interval appendectomy, regardless of our belief that an operation at such time is much safer.

I believe this is the largest number of cases of suppurative otitis media reported with routine x-ray examination of the mastoids regardless of whether mastoid symptoms were present or not.

My idea primarily was to learn from the distinguished aurists present just what class of cases should be operated upon, and what group of symptoms would justify an operation.

Dr. Hali inquired how the x-ray man could tell just what one wanted to know. Unfortunately they could not always tell that, but they could tell when there was a deviation from the normal and their description of the changed condition taken with other symptoms often furnished material assistance in determining a plan of treatment.

I thank the gentlemen for their liberal discussion.

Warning—Sanitary Pads Not Sterile. Our attention has been called, from time to time, to the fact that sanitary pads, highly advertised and commercially available to everyone, are being used increasingly in connection with postpartum care under the mistaken impression, evidently, that they are sterile. The Division of Maternity, Infancy and Child Hygiene, New York State Department of Health, has taken this matter up with the scientific department of a surgical supply house, who state that none of the pads commonly available in the drug trade have been sterilized because of the increased cost and because they are a highly competitive product.

Practically none of the pads in the open market are adapted for use in connection with surgical wounds or with the after-care of confinement cases. While they are clean, no doubt; they are not guaranteed as being sterile. Nurses and physicians should govern themselves accordingly.—*Health News*, New York State Department of Health, July 22, 1929.

LARYNGEAL STRIDOR AND DYSPNOEA IN CHILDHOOD*

By E. C. YATES, M. D., Lexington Clinic,
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Since the earliest times the voice-box has been an unknown factor as regards its function and physiology. Until the work of Johanness Munier, 1639, little was known of the anatomy of the larynx and the speech and voice. Before this, in 1829, Babington introduced laryngoscopy with the mirror, but little advance was made until 1858, when the vocal cords were first demonstrated by Ernest Krakowizer in New York. Since then many men have contributed to its development. Samuel Gross—foreign bodies air passages 1854. Sir Morell Mackenzie on laryngeal tumors 1871. Intubation was first done by Bouchart in Paris, 1818, but was perfected by Joseph O. Dwyer in about 1860. These men and many other laryngologists have perfected the science of laryngology by their conscientious labors. It is through these men and Brunning and Jackson that we have the means at our disposal to be of real practical value to our patients with dyspnoea and laryngeal stridor.

This paper is presented not with the purpose of advancing anything new but to deal in a general way with some of our general problems. I wish to direct your attention to some of the practical phases of laryngeal stridor and dyspnoeas in childhood. No field has advanced more in the last decade. This is due to the untiring efforts of laryngologists and the perfection of the lighted scopes. No group of cases, it seems to me, is of such prime importance to the laryngologists as these children presenting such alarming symptoms. I will confine this paper to the causes of laryngeal stridor and dyspnoea in childhood. These may be classed as follows:

- I. Nervous disorders.
- II. Extrinsic causes.
- III. Intrinsic causes.

I. Nervous disorders. The most important is laryngitis stridulosa or spasmodic croup. In childhood and infancy the characteristic feature is the association of muscular spasm with every form of inflammation. Often it is the laryngeal spasm rather than the inflammation which gives rise to the principal symptoms. This spasm is only one expression of the great reflex irritability of young children. This is due to a catarrhal inflammation of mucous membrane of the larynx occurring in children from six months to the third year. It occurs oftener in children who are well nourished. These attacks come on with slight cold. At night the child

awakens with severe dyspnoea and slight cyanosis. The attack subsides at daylight but hoarseness and cough may persist. Patients subject to recurrent attacks. Laryngismus stridulus is the same condition only associated with very marked symptoms. These cases are often fatal, necessitating intubation. In one case recurrent attacks had occurred in a child four years old three successive nights in spite of treatment. An intubation was done, symptoms subsided and patient made a complete recovery. Tetany in children associated with carpopedal spasm and laryngeal spasm is characterized by severe irritability of central nervous system. This occurs most frequently during last half of first year and during second year and is frequently associated with rickets. This condition is due to an unbalance of calcium—more excreted than ingested. Some workers observed that a deficiency in para-thyroids produces the symptoms (Erdhem and Yanose). Heredity may likewise play a part. Frequently tetany exists in children in mild degree. The so-called "holding breath spells" and choking in fit of anger etc., are undoubtedly mild forms of tetany.

General convulsions are very common in tetany in infancy. Lederer describes a complex of pulmonary symptoms closely simulating asthma which he terms broncho-tetanic. Dr. R. B. Canfield has observed a case during asthma which he described as a series of annular contractions of the tracheal mucous membrane. It is entirely speculative, however, to state that these findings are due to tetany. In my short experience I have observed another type of dyspnoea in infants which was not associated with tetany or any intra-laryngeal lesion. This child was normal at birth, full term, was breast fed until two months of age. Baby placed on formula and made normal gain in weight. When three months of age, child began to "crone" during sleep in day and night. The symptoms were very alarming to the parents. The child's symptoms became severe and was seen when three and one-half months old. Examination of the child was negative. The larynx was examined but no abnormalities were found. The child was kept under observation for two and one-half months, then symptoms entirely disappeared. We were unable to classify this case but felt possibly it was due to some allergic reaction, but inasmuch as no skin reaction was present, eczema, etc., and skin tests were negative, this was eliminated. No doubt this may be one of Lederer's cases of broncho-tetanic.

The thymo-lymphatic child is frequently found in a thick, short, fat necked baby. It is questionable whether the size of the glands causes symptoms from pressure or by hypersecretion or hyposecretion. The appearance

*Read before the Eye, Ear, Nose and Throat Section of the Kentucky State Medical Association, Lexington, May 22nd-23rd, 1929.

of the child during an attack would lead one to assume that it is not the pressure but the secretion which precipitates the attack. Jackson says that thymic death is attributed to hyperthymization of blood and is nothing more or less than arrested respiration, which is fatal because respiration when arrested by obstruction cannot be started. This is hard to fit into cases as the patient is not cyanotic but pale due to dilatation of the peripheral bronchioles with increased oxygenization of blood and probably a peripheral constriction of capillaries. It would seem more probable to have patient cyanotic if symptoms were due to obstruction. For example, a physician's baby six months old was to have a circumcision done and in routine preparation for operation an enormous thymus was found. The child never had symptoms with reference to thymus at any time. X-ray treatments were given. Patient had slight thymic attacks 72 hours after first treatment. Nothing unusual occurred afterwards. The most probable thing is that the symptoms are due to an endocrine substance thrown into blood stream.

II. The next group of cases are those due to extrinsic causes—by pressure and obstruction. Of this group perhaps the most frequent cause would be:

- (a) enlarged glands.
- (b) tumors.
- (c) abscesses.
- (d) injuries.
- (e) foreign bodies.
- (f) edema—intrinsic and extrinsic causes.

Enlarged glands. The child with its marked hyperplasia of lymphoid tissue in throat and naso-pharynx is very susceptible to infection thus giving rise to infected glands and suppuration. The glands, if sufficiently large will exert enough pressure to produce dyspnoea. One condition here offers an interesting subject. All of us are familiar with the enlarged goiter causing dyspnoea. It is true that the slowly growing gland is less apt to cause dyspnoea than in a rapid change occurring in glands. In cases of secondary pathological changes occurring in the gland, such as hemorrhage and suppuration or in fibrosis as in ligneous thyroid, one is more apt to have severe dyspnoea which is continuous. Other changes in gland may cause intermittent attacks of dyspnoea.

Abscess. Retropharyngeal abscess will often cause severe dyspnoea. This condition is not frequent but offers a good subject to dwell on to recall a few things to our minds. No other condition is so frequently diagnosed wrong. Two years ago I looked over the histories of thirty-four cases, which had been treated and have found some points of interest as to symptomatology and diagnosis.

- (1) 96% of cases occur under 6 years of

age—most all below age of 3.

(2) Retropharyngeal abscess is the end stage of lymphatic gland involvement due to neighboring infectious process in lymphatic tissue, chiefly tonsils. The other source tuberculosis of spine—Pott's disease.

To understand the frequency of retropharyngeal abscess before six years of age we must recall the anatomy. The retropharyngeal glands are in loose areolar tissue behind the pharyngeal wall and in front of deep prevertebral muscles at level of upper two or three cervical vertebrae. It is interesting to note that the retropharyngeal tissue in adults only contains one or two glands, while in children under 6, eight or ten may be found. Retrogression and atrophy of glands take place as individual nears puberty.

The symptoms of retropharyngeal abscess are insidious in their onset and as a result may put the unwary off the proper trail. Most of the abscesses occur high and only give rise to nasal symptoms but they do occur lower and it is in these that respiratory symptoms become prominent. Although the neck as a whole is relatively longer in children than in adults, the larynx in infancy is fully one vertebra higher in position. Encroachment, therefore, and interference with respiration are relatively more possible in children than in adults.

Injuries. Injuries may cause swelling of larynx and trachea. These causes are often found in tracheal tubes after having been worn for a long time. The trachea has a tendency to contract. This is due to softening and unfolding of cartilages of trachea. These necessitate wearing tracheal tubes sometimes for a few years.

Foreign bodies. Foreign bodies outside of larynx or trachea as a cause of pressure will be usually found in pharynx or esophagus. A case will illustrate:—child 3 years old, gave history of coughing and choking two months previously. Child recovered shortly except for little difficulty in breathing. These symptoms became aggravated and the parents noticed he was unable to swallow food. Examination: had stridor with both inspiratory and expiratory difficulty. Radiograms showed a large piece of tin near cricoid constriction. This was removed and all symptoms subsided.

Edema of glottis. Although rare in childhood may be due to a nephritis or a mechanical irritation of foreign body and extension of erysipelas of neck.

III. Intrinsic causes:

- (a) congenital stridor.
- (b) new growths.
- (c) stenosis, burns, scars.
- (d) foreign bodies.
- (e) acute inflammation with or without

membrane formation.

Congenital stridor. Patient has stridor with dyspnoea due to folding of epiglottis and narrowing of vestibule. Stridor is noticed soon after birth and inspiratory in character and may increase in severity. This usually disappears after two years. Iglaner in 1921, before the academy recommended epiglottideotomy for relief of symptoms and reported one case. One other aid in this condition is to teach children to lie on the abdomen.

New growth. Papilloma is the most frequent growth met with in the larynges of children and may be congenital. It occurs as a warty or cauliflower-like mass on vocal cords or any surface in the larynx. Jackson reports one case of congenital and one probable congenital papilloma in children. Recently I have had a case which is possibly a congenital papilloma—child two years old whom the parents state has had hoarseness since birth and periods of cyanosis, especially when the child exerted itself very much. Child gave a history of having had chicken-pox when 6 months old. Symptoms have become worse during past 6 months. Examination showed a cauliflower-like growth in anterior commissure of larynx and attached to right cord. Vegetative papillomata have marked tendency to recur until they have reached a physiological limit. When this stage is reached the growth is white in appearance. Various methods have been suggested for removal, such as excision, cauterization, fulguration, caustics, etc., after preliminary tracheotomy has been done to put larynx at rest. Fibromata are very much similar. These develop due to splitting of longitudinal fibers of larynx with granulation tissue deposit in attempt at repair. Retention cysts on cords occur often in very young children. One case I recall, an infant 6 days old, became dyspnoeic and cyanotic rather suddenly. Just as physician stepped into room, child stopped breathing. The consultant placed his little finger down into the larynx and when he brought out the finger it was covered with a thick mucoid substance. After artificial breathing was instituted the child began to breathe. This undoubtedly was a retention cyst.

Stenosis. Stenosis may follow scars from burns, from caustics, ulcerations, and infectious diseases, such as smallpox, diphtheria, etc.

Inflammation. Acute inflammations may cause dyspnoea from severe congestion of the mucosa and may be encountered in flu, scarlet fever, and mixed infections. Diphtheria with membrane formation in the larynx is the most frequent cause of disturbed breathing in acute infectious diseases, but we may also have streptococcus and mixed infections with the same symptoms. The laryngologists are fre-

quently called to see such a child in "extremis" and it becomes necessary to do an intubation or tracheotomy to relieve immediate symptoms and the diagnosis is made by smear and culture afterward. The latter cases are very severe and the mortality is high. It behooves one to examine the larynx in children if necessary with the aid of a laryngoscope.

DISCUSSION

J. A. Stucky, Lexington: I am glad so many of the interesting features in this paper were emphasized because I feel there is a tendency to ignore the fundamental facts brought out by the essayist. In many of the cases it is impossible to make a diagnosis of the cause of the condition without direct laryngoscopy. Involvement of the thyroid or parathyroid is undoubtedly the cause of many cases of frequently recurring dyspnoea. The involvement of these endocrines causes an imbalance either from toxicity or nutritional deficiency.

Samuel B. Marks, Lexington: I have enjoyed Dr. Yates' splendid paper. In discussing stridor he mentioned tetany and thyroid dysfunction as causes associated with holding the breath. I have seen two or three cases at least where I was quite sure the thymus was the cause of apparent attacks of holding the breath. Anger, sudden fright, and other factors are frequently responsible, as the thymus becomes congested and causes pressure on the trachea. These features must always be considered and excluded before a diagnosis of obstruction is made. Certain blood dyscrasias, as Jackson mentions, seem to be responsible for persistent dyspnoea in some cases even where the thymus is enlarged. Some of these children die promptly in spite of roentgen-ray and other treatment.

I have recently seen two interesting cases of laryngeal stridor in young children, which was inspiratory as all laryngeal stridor is. The first was a child one year old and everything else was excluded. We could neither see nor find anything. She had a temperature of 102° F., respiration 70 to 90, with marked stridor. Later examination disclosed an abscess in one ear which was incised and the fever subsided. Laryngeal examination showed redness, edema and thickening of the folds sufficient to cause the inspiratory stridor. We discovered afterward upon careful questioning that two or three days previously she had choked on a piece of celery and had expelled it by coughing. I think the piece of celery was primarily responsible for the trouble due to an anaphylactic reaction.

Another child was brought to the office with a similar condition, except there was no history of choking on celery. Laryngoscopic examination revealed considerable infiltration of the arytenoid folds and false cords causing obstruction. I sent her to my brother asking him to make a thorough physical examination, which he did, including roentgen-ray investigation. The

child had an active tuberculosis, and without question the laryngeal condition was tuberculous in origin. She was placed in the sanitarium and is doing well.

I have had one case of post-diphtheritic occlusion of the larynx that gave me some anxiety and trouble. The child was almost dead when I first saw him, but came to life upon intubation. Two weeks later I did a tracheotomy, not being able to extubate him. After repeated dilatations of the laryngeal stricture he was successfully extubated and dismissed as cured.

Edmond D. Wells, Louisville: In the treatment of spasmodic croup I have found very satisfactory a spray of ethyl chloride on each side of the neck. Each treatment takes about half a minute. I have never seen any deleterious effects.

As to the thymus gland being the cause of dyspnea, my thoughts are in accord with those expressed by Dr. Marks. I believe it is a frequent cause. I have had such a case within the last few months. Roentgen-ray examination was made which showed the thymus extending over to the trachea, causing quite a little deflection in the normal course of the trachea. Dyspnea was due to direct pressure.

Walter Dean, Louisville: Dr. Yates was fortunate in selecting larynx as his subject. I am very interested in the larynx and feel that as laryngologists we think too much about the tonsils and not enough about the larynx. Laryngology, though not nearly so old as ophthalmology, was a well developed specialty long before the nasal sinuses were suspected of pathology. It took an eternal period to develop the laryngoscope but when once developed these old keen eyed clinicians rapidly developed their science. I feel sure Dr. Yates did not mention Prof. Killian's name in reference to the later development of the direct laryngoscope. He deserves the highest credit since he gave us direct laryngoscopy, bronchoscopy, oesophagoscopy, submucous reaction of the nasal septum and the modern external frontal sinus operation.

As it is next to impossible to examine the larynx of a well infant and impossible in a sick one, with the indirect laryngoscope, the direct laryngoscope gave us the means to diagnose such a condition as stridor in a living patient. Prior to that time all our positive information was obtained at necropsy.

Laryngismus stridulus is the most dramatic disease I have ever seen but I have never seen a fatality. Fortunately carbon dioxide poisoning eventually causes the patient to relax and breathe normally.

ACUTE OTITIS MEDIA WITH FACIAL PARALYSIS*

By JAMES ROYDEN PEABODY, M. D., Louisville.

In selecting a subject for a paper to read before this society, I have in the past attempted to interest you in as well as to enlighten you about some unusual ear, nose, or throat condition which I had encountered in my practice; but on this occasion I have chosen a subject about which most of the members, especially the neurologists, are well posted, so I am depending upon you to give me considerable information in your discussion.

At the present time I have under observation a patient who has recovered from a facial paralysis either associated with or complicating an acute otitis media.

After reporting this case I am sure that some of you will say that my patient had the ordinary facial paralysis known as Bell's palsy, and that the middle ear inflammation was simply a coincidence and not the causative factor although both conditions were dependent upon a common cause, namely the after-effects of influenza.

We all know that the great majority of cases of facial paralysis—some authorities say seventy-three per cent—are of the so-called rheumatic type and probably due to the exposure of the face to a prolonged draft or are toxic in origin, also that considering the number of acute ear cases treated by otologists we see but few cases if any of facial paralysis complicating acute otitis media without mastoid involvement, and statistics show that less than one per cent of all otitic suppurations are accompanied with damage to the seventh nerve; but MacKenzie calls attention to the fact that many statistical cases have not had adequate ear examinations and that those classified as of unknown origin would have been accounted for by an inflammation of the middle ear.

During my experience in ear work I have had referred to me many patients with facial paralysis for an ear examination, but this was only the second time when I felt reasonably sure that the seventh nerve involvement was caused by the acute otitis.

In the medical journals there have been reported numerous cases of acute and chronic mastoiditis, with or without intra-cranial complications, where every cranial nerve has been affected except the olfactory and trochlear nerves, but with the exception of paralysis of the sixth nerve producing Gradenigo's syndrome, otologists rarely see any cranial nerve complication other than the facial.

Let us review briefly the anatomy of the

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seventh nerve after its fibers have reached the nucleus from the cortical center.

The nucleus of the facial nerve lies beneath the fourth ventricle. The nerve fibers coil around the nucleus of the sixth nerve and emerge at the lower border of the pons to enter the internal auditory meatus along with the auditory nerve. At the bottom of the meatus it enters the fallopian canal following a serpentine course—at first it is directed outward towards the inner wall of the tympanum where it forms a gangliform swelling called the geniculate ganglion and is joined by several nerves the principal one being the accessory portion known as the *pars inter-media* of Wrisberg and carrying sensory impulses from the tympanum, external auditory meatus, part of the surface of the pinna, also from the inner and middle ear, mastoid cells and eustachian tube. At the geniculate ganglion the facial nerve bends suddenly backward running in the upper wall of the tympanum above the oval window, then it is directed vertically downward giving off here the branch to the Stapedius and below this the *corda tympani* branch. It emerges from the skull through the stylo-mastoid foramen running forward in the substance of the parotid gland, crosses the external carotid artery and finally dividing behind the ramus of the lower jaw into its many branches which supply all the muscles of expression in the face with the exception of levator palpebrae superiores, also the platysma and buccinator muscles, the muscles of external ear, the posterior belly of the digastric and the stylohyoid.

There are two varieties of facial paralysis—central and peripheral. The central type is caused by a lesion above the facial nucleus, while the peripheral type is due to a lesion of the nucleus or of the nerve distal to it. Although it is exceedingly important, it is not within the scope of this paper to make a differential diagnosis between the central and the peripheral varieties, but I would like to remind you that a lesion in the tract from the cortex to the nucleus does not affect all the branches of the facial; the reflex excitability of the muscles is preserved; also that there is usually paralysis of the extremities of the same side or sometimes the other side.

The causes of seventh nerve involvement may be: 1. Intra-cranial diseases such as a new growth, aneurysm, cerebral hemorrhage, embolus, or thrombus, abscess, inflammations especially syphilitic, and injuries to the base of the skull. 2. Rheumatic, toxic and idiopathic cases—these constitute in my opinion the typical cases of neuritis of the seventh nerve commonly known as Bell's palsy. 3. Injury, parotid swelling, peripheral neuritis occurring at or beyond the stylo-mastoid

foramen. 4. Diseases of the temporal bone; the principal diseases being acute or chronic otitis media complicated or uncomplicated by mastoiditis. Otologists are concerned with this last classification, and Kerrison states in his book that facial paralysis of otitic origin may result from any of the following conditions: 1. Acute suppurative otitis media of severe type, the inflammatory process extending through the tympanic wall of the Fallopian canal and the nerve being either directly involved or subjected to pressure by inflammatory product within the canal. This is commoner in young children than in adults. 2. During acute suppurative otitis media as a result of direct exposure of the nerve through a defect in the tympanic wall of the facial canal. 3. In chronic suppurative otitis media the necrotic process involving the facial canal. 4. In suppurative labyrinthitis secondary to chronic middle ear suppuration. 5. Occasionally associated with otitic meningitis in which case the nerve lesion is probably more often the result of an intermediate infection of the labyrinth. 6. Tuberculous lesions: In a large percentage of cases of middle ear tuberculosis the facial nerve is involved, and a facial paralysis occurring at the onset of an acute otitis media or before rupture of the drum, is indicative of tuberculosis. 7. Herpes zoster of the auricle: Here the morbid changes in the nerve are clearly an extension of the inflammatory process affecting the geniculate ganglion.

Quoting from Dr. Ramsey Hunt:—He "regards the facial as a mixed cranial nerve homologous with the trigeminal, glossopharyngeal and vagus. In common with these the seventh nerve has a definite group of symptoms dependent upon involvement of its sensory portion although in man the motor functions are predominant." The sensory symptoms of a lesion of the geniculate ganglion consists of pain, facial spasm and herpes in the geniculate zone and commonly associated with facial palsy and often with auditory symptoms.

History of the case—On April 19th, 1929, Mrs. H., aged twenty-five, was sent to me by her sister on account of earache, severe pain in the left side of her face, and as her sister expressed it: "She cannot close her left eye and her face looks twisted." The patient gave the following history: Her father was living and well, her mother died three years ago from pulmonary and laryngeal tuberculosis; otherwise her family history was negative. On account of some form of kidney trouble, she had a tonsillectomy nine years ago, which was followed four days later by a severe secondary hemorrhage necessitating a post-nasal packing. Two weeks later she developed an abscess in both ears with spontaneous rupture

of both drums. The ears drained for several weeks but there were no mastoid symptoms and her recovery was complete. She had been in good health ever since until April the 12th, when she had an attack of gripe during the recent epidemic. Six days later when she was practically well from the gripe, she had on the night of April the 18th, a severe earache in her left ear, severe pain in the left side of her face and numbness in the tongue. The tongue felt paralysed on one side, there was no twitching in the face muscles. The pain in the ear and face lasted several hours, the patient using hot applications, three five grain aspirin tablets, besides phenol and glycerine ear drops. Finally she was able to get a few hours sleep and noticed on awakening that the left side of her face appeared peculiar, and she could not close her left eye, also she still had pain in her ear and face and was deaf in her left ear.

My examination of this patient showed that she had a temperature of ninety-nine and four-fifths degrees and pulse one hundred, also that she had a fairly well marked paralysis of all the facial muscles supplied by the seventh nerve. The left eyelids were separated by a wide interval and the patient could not close her lids, while during the attempt at closure the eye ball made an upward and outward movement. The eye was moist and there was some tearing on the cheek. The naso-labial fold was obliterated and the left corner of the mouth sagged, the lips could not be properly placed so as to whistle or show her teeth. I did not test the taste sensation at the first visit.

The ear examination showed the upper posterior part of the left ear drum was definitely reddened and slightly bulging; the hearing for low tones was impaired but there was no tinnitus or hyperacusis, and there was tenderness over the mastoid especially near the tip. A slight swelling was noticeable in front of and below the ear. Movement of and pressure on the auricle was not painful. Because I believed that my patient possibly had a facial paralysis superadded to a simple otitis, and also because I had in mind a case seen at the City Hospital over ten years ago where we were dealing with a herpes of the auricle with facial paralysis, and that this condition may simulate acute otitis and acute mastoiditis, and lastly because the signs and symptoms of acute otitis media were not well marked, I decided to wait twenty-four hours for further developments. My patient returned to the office the following day stating that she had suffered considerable pain in her ear during the night, and that the left side of her face felt more swollen. As the changes in the ear drum were more marked, and her temperature ninety-nine and eight-

tenth degrees, I opened the ear drum under gas anaesthesia and there was an escape of muco-purulent secretion. She was instructed now to irrigate the ear with boric acid solution besides using hot applications to her face, and requested to report the next day. Because she phoned me she felt much relieved I did not see this patient again until forty-eight hours later, when I found her practically free of pain, her temperature and pulse were normal, there was no pain nor tenderness over the mastoid and the hearing in the left ear was almost normal, the left side of the face still presented a swollen appearance and there was no change in the degree of facial paralysis. There was still present some discharge from the ear. The sensation of taste was normal. The patient was instructed to close the eye frequently by gently pressing the lids together, also to wear a pad of moist cotton over the eye during the night.

Referring to the text books for the general treatment of such a condition, I found that some authorities recommend light skillful massage from the beginning, also that electrical treatment is contra-indicated during the first week or ten days, but there is no objection to faradic or galvanic tests at any time. I learned that complete loss of faradic irritability and greater anodal closure contraction than cathodal closure contraction means that the case is severe and no marked improvement can be expected for many weeks, many severe cases never recover completely. On the other hand, if faradic irritability is retained the paralysis may disappear without any electrical treatment in from two to four weeks. Since April the 22nd, this patient has been seen by me several times. Ten days from the time I first saw her the discharge from the ear had ceased and there was a slight improvement in the facial paralysis. On May the 28th, nearly all traces of paralysis had disappeared, but the patient could not whistle and the left eye did not close as completely as the right, and on June the 10th, all traces of paralysis had disappeared.

Although I cannot prove that this paralysis was caused by the otitis and I know that it appeared almost at the same time as the otitis, it is easy to understand how the facial nerve can be involved when we remember: 1. That it is a large nerve in a rather long and small rigid bony canal. 2. That the outer wall of the Fallopian canal containing this nerve forms the inner wall of the middle ear cavity and that this wall is often very thin and even there may be dehiscences in the bone. 3. That there are several openings in the wall between the canal and tympanum for the passage of nerves and blood vessels. All of these factors predispose to the spread of infection from the middle ear to the facial canal.

There seems to be a difference of opinion as to how the paralysis is brought about. Rontzger stated that it must be pressure on the nerve within its bony canal because this nerve has been found lying free in the tympanic cavity bathed in pus without symptoms of paralysis. Ney's experience during the world war with infected wounds showed that an intact nerve trunk is very resistant to surrounding suppuration, but is quickly affected by slight compression. Ney also calls attention to the fact that the facial nerve in its course through a long bony canal, which it entirely fills and to which its sheath is closely attached will be compressed by mild degrees of vascular changes, where nerves not confined by a bony wall would not be affected by similar vascular changes because of the elasticity of the surrounding tissue.

We can easily understand how a disturbance in the function of the facial nerve can develop in the course of acute mastoiditis or a chronic middle ear inflammation where there is an actual necrosis of the bone close to the nerve, yet facial paralysis is comparatively rare even under such conditions, but in my case there had not been sufficient time for necrosis to take place so it must have been an inflammatory exudate with pressure on the nerve.

PROGNOSIS

This depends upon the degree and cause of the paralysis, but it must always be made very guardedly because even in the simple so-called rheumatic cases the paralysis lasts for quite a long time and contracture of the paralysed muscles may occur.

If a simple acute otitis is the cause, the paralysis usually disappears in a few weeks, although it may persist for several months after the ear condition has subsided. The response to electrical reaction will assist in making the prognosis.

TREATMENT

There is not a great deal to be said about the treatment, although after referring to numerous text books and to the reports of cases by many otologists, it is my opinion that it is seldom necessary to resort to such radical treatment as they recommend.

Several ear men consider facial paralysis with acute otitis media an absolute indication for a mastoid operation. The following paragraph was found in the most recent text book, "The Nose, Throat and Ear and Their Diseases," edited by Jackson and Coats: "Facial palsy is not often seen in acute aural disease, but when present it is quite as urgent an indication for surgical intervention as when found in the chronic form. In either case it must be determined that the aural disease is the etiologic factor." Dr. Leon White of Boston states that formerly it was

the procedure at the Boston ear infirmary to operate early on the mastoid of these patients, but now such cases are treated conservatively. In my own limited experience with two cases the paralysis disappeared in a short time after free drainage from the middle ear, but, of course, I was on the lookout for any mastoid complications and would not have hesitated to do a mastoidectomy if the signs and symptoms warranted. As regards direct treatment, electricity is indicated if properly applied but my two patients recovered without it.

Even in severe and long standing cases electrical treatment has not only improved but has brought about almost complete cure.

Of course, the eye has to be watched very carefully as these patients are prone to develop conjunctivitis and occasionally ulcer of the cornea.

Finally, to summarize this paper: 1. On account of its anatomical peculiarity the seventh nerve is more often involved than any other cranial nerve.

2. About seventy-five per cent of all cases of facial paralysis are rheumatic or toxic in origin.

3. Nearly all cases of facial paralysis are of the peripheral variety.

4. Congestion, hemorrhage or pressure of slight inflammatory exudates within or without a nerve sheath in an unyielding bony canal could produce functional disturbances.

5. It is possible for a facial paralysis to be caused by a simple acute otitis media without mastoiditis, but very few cases have been reported in literature.

6. The paralysis comes on suddenly and nearly always affects all the facial muscles supplied by the facial nerve.

7. The treatment of facial paralysis caused by or associated with acute otitis calls for conservatism and recovery takes place quickly after free drainage of the middle ear abscess.

8. Electrical treatment of the paralysed muscles should be carried out only in the hands of experts and in protracted cases, but it is not necessary in the mild forms.

DISCUSSION

Samuel G. Dabney: I always enjoy Dr. Peabody's papers. It seems to me there is a decided difference between facial paralysis complicating acute suppuration of the middle ear, and the same disease complicating chronic suppuration; in the latter the paralysis is generally an indication for a mastoid operation, while in the acute cases such operation is not called for unless other symptoms demand it. I think several of the text-books favor this teaching.

In my personal experience I can recall only one case of facial paralysis complicating acute disease of the ear without mastoid symptoms. This patient was a lady about 40, with severe acute

catarrhal inflammation of the middle ear complicated by facial paralysis. She made a complete recovery in several weeks with the usual treatment for such disease of the ear. I can recall a few cases also in which there was facial paralysis complicating acute suppurative disease with marked mastoid symptoms. These patients recovered after mastoid operation.

I congratulate Dr. Peabody on the good results in his case.

Cumtbert Thompson: I can see no reason why there should not occur an acute perineuritis involving the facial nerve during the course of acute suppurative otitis media, because the facial nerve is separated from the middle ear cavity by only 1-100th inch of bone and two thin membranes. The only wonder is that it does not occur oftener. Congestion and swelling of the nerve in this narrow bony canal is doubtless a frequent cause of so-called Bell's palsy.

In nearly all these cases as soon as the middle ear inflammation is relieved the facial paralysis begins to subside, but it may be two or three months before it completely disappears. The paralysis in these cases is not due to suppuration but to pressure on the facial nerve. There is no destruction of nerve tissue.

I congratulate Dr. Peabody on his paper and the result obtained in the case reported.

R. Glen Spurling: I wish to make a few comments on the sensory symptoms presented by this case. Inasmuch as there was pain in the distribution of the fifth nerve, the question would arise whether or not there was an extension of the inflammatory process into the skull around the gasserian ganglion. This appears to be unlikely, however, in view of the course of the disease. We know that in some cases, the seventh nerve carries in addition to the muscle sense to the face some fibers which conduct painful stimuli. That may have been the explanation for the pain in the face in this instance.

As to the question of treatment of facial paralysis, I have always felt that Faradic stimulation helped in the restoration of function; namely, that it helps to prevent atrophy of the muscles of the face by stimulating them directly while the nerve is regenerating.

You are all familiar, of course, with patients who have suffered from facial paralysis and have had atrophy of their muscles therefore, their face is asymmetrical. This, I think, can be prevented by persistent electrical treatment.

William E. Gardner: That Dr. Peabody secured such prompt relief of the paralysis after myringotomy certainly argues strongly for the fact that the middle ear was a factor in production of the paralysis in the case reported. Whether the facial paralysis was due to the middle ear infection, or whether it was the result of pressure neuritis, cannot be stated with certainty, but where there is swelling and edema of a small bony canal, pressure could actually

produce neuritis, and paralysis may ensue from either infection or pressure.

We know authorities claim that a very small percentage of cases of facial paralysis can be traced to middle ear disease, and that it is generally due to influenzal or rheumatic infection which is the ordinary peripheral paralysis of the seventh nerve, yet the fact that a certain number of cases have been reported following middle ear disease is significant to say the least.

It seems to me that the treatment employed by Dr. Peabody in the case reported was wise. In ordinary cases of Bell's palsy due to influenzal or rheumatic infection the duration is long and we do not expect very much regeneration of the nerve inside of six weeks. Sometimes it is three months before we get much regeneration of the nerve. In this case the recovery was prompt, indicating a pressure neuritis, only.

So far as the application of electric currents is concerned, I use the Faradic current in such cases only for diagnostic purposes. The Galvanic current is preferable for preserving and improving muscular tone, thus preventing muscular atrophy. The Galvanic current acts on the muscle, the Faradic essentially on the nerve. If there is more or less reaction of degeneration of the facial nerve with the Faradic current, the Galvanic current may be used within a few days after the acute symptoms have subsided, then it is proper to continue with the Galvanic current indefinitely or until the nerve undergoes resolution.

If in the early stage of Bell's palsy there has been sagging of the face due to the paralysis, there will later be contraction of that side of the face on account of atrophy and contraction of the muscle. It is seldom this can be entirely avoided, and it is sometimes difficult to overcome by treatment.

The point at which the lesion must occur to affect the taste fibers is in a very limited area. This is between the geniculate ganglion and the junction of the chorda tampani nerve. If the lesion is located in this situation, then we have involvement of the taste fibers. There is never involvement of the taste in nuclear paralysis of the seventh nerve, nor do we usually have involvement of the taste in purely peripheral paralysis. In the ordinary cases of hemiplegia due to a central lesion or supranuclear paralysis, the reason involvement of the upper branch of the seventh nerve does not occur is because the nucleus receives fibers from both sides of the cerebral cortex. As a rule an individual with hemiplegia can close that eye and wrinkle his forehead, whereas in complete paralysis of the nerve, whether peripheral or nuclear, he is unable to do either.

So far as treatment is concerned, it consists in removal of the cause, if possible, and general hygienic care, together with the use of the Galvanic current. The nutrition of the patient

should be improved by regulation of diet. In old cases where the nerve seems slow in regenerating, certain mechanical means have been used to elevate the corner of the mouth. Various devices have been described. The old method of using a pad in the corner of the mouth has been abandoned.

Dr. Peabody's case has been very interesting. I always like to hear of these cases from the standpoint of a man who does eye, ear, nose and throat work. This case could not have been presented better by a neurologist than it has been reported by Dr. Peabody.

Philip F. Baibour: I have had no experience with facial paralysis in adults, but have come in contact with a number of such cases in children. Within the last month I have seen two children who suddenly developed facial paralysis without any ear symptoms or any local condition to which I could attribute it. One child has been in bed for quite a while. They left her near a window, where she was exposed to the draft, and left-sided facial paralysis suddenly developed. I told the mother I thought the trouble was due to exposure to draft from the window and the child would probably soon be well. It has now been nearly three weeks since the initial symptoms developed, the child has practically recovered, she has almost regained control of the facial muscles and can close the eye on that side. I believe a draft constantly blowing on the face for any length of time is not infrequently the cause of facial paralysis in children. I have seen many other cases in private practice where the same explanation seemed reasonable. In cases of this type the patient generally recovers rather promptly.

Last spring I saw a child with mastoiditis upon whom mastoidectomy was performed, but before the operation there was a definite facial paralysis on the same side. Dr. Spurling saw the patient and expects to report the case more completely, but I would like to say a word or two now. This child had a definite facial paralysis associated with paralysis of the external rectus muscle, the child being unable to move the eye on that side. There was incoordination of movement. Dr. Spurling diagnosed cerebellar abscess which was confirmed by operation. The facial paralysis and also paralysis of the rectus muscle began to improve immediately after operation. So far as I am able to learn the child made a complete recovery. In that case we believe the cerebellar abscess had produced pressure on the seventh nerve and also extended to the sixth nerve.

It would seem to me, from the cases of facial paralysis I have observed in children, that counter-irritation over the mastoid, the face and meninges, is indicated. Under this treatment the patients generally get well. However, I always send my patients with facial paralysis to a competent otologist to determine whether or not

there exists any middle ear disease. In most of the cases the otologist has reported there was no ear trouble. These patients have all gotten well. I do not know of any explanation for the development of facial paralysis in these cases unless it is due to pressure on the seventh nerve in the narrow bony canal from slight hemorrhage or swelling.

I am impressed with the fact that I have seen very few cases of otitis media associated with facial paralysis, and also the few cases of definite mastoiditis I have seen in which facial paralysis was a complication. I have had mastoidectomy performed in many cases, but have consistently failed to find facial paralysis as an associated feature. There must be some explanation for the absence of facial paralysis in these cases in children, but what it is we do not know. We may find some day that our present explanations are all wrong.

James Royden Peabody, (in closing): I thank the gentlemen for discussing my paper. Dr. Dabney raised some interesting points that I shall endeavor to clarify as best I can. About the tonsillectomy, secondary hemorrhage and post-nasal packing nine years before the patient came to me. I did not mention it, but she must have had an adenoidectomy at the same time. Her statement about the post-nasal packing was very clear. She told me how exceedingly uncomfortable it was. The history was also clear about her ear trouble, as she said "both ears broke." She had bilateral suppurative otitis media with spontaneous rupture of both membrana tympani. The family physician did not open either drum membrane—the patient lived some distance in the country and had suffered quite a while before calling a doctor—but after spontaneous rupture occurred he treated her for the middle ear disease and she recovered.

Referring to the remarks of Dr. Thompson: I did not mean to imply that facial paralysis usually occurs as early as the third day after the development of acute suppurative otitis media. In most cases paralysis develops late, i. e., the ninth or tenth day. The earliest case where facial paralysis developed after the onset of acute otitis media, found in literature, was on the third day.

The edema in front of the ear confused me. There was a definite swelling which could be plainly seen. In reading about facial paralysis in general, I find Oppenheim says that often there is edema of the face, but he makes no explanation for its occurrence. Edema and swelling of the face may be noted in facial paralysis of the so-called rheumatic type, or that associated with middle ear disease.

As to the location of the lesion: I also found that Oppenheim gives a drawing of the facial nerve with its branches and designates the various segments by numbers. If the lesion, for

example, occurs between No. 1 and No. 2, which is above the chorda tympani nerve, there will be absence of taste sensation in the outer two-thirds of the tongue together with salivation. The patient in the case I have reported was not salivated. If the lesion occurs above the branch of the stapedius muscle there may be tinnitus and hyperacusis. Then he says if the lesion occurs in the geniculate ganglion, there will be herpes and also intense temporo-parietal pain. If the lesion occurs above the geniculate ganglion, there is no change in the sense of taste. Then he finally says: "THIS DOES NOT ALWAYS HOLD TRUE." Sometimes in one segment all the nerves are not affected, so it is impossible to accurately locate the lesion.

As to electrical treatment of facial paralysis: I did not wish to imply that electrical treatment is not beneficial, as that would be directly contrary to my belief. The patient to whom I have referred could not be induced to return for electrical treatment for several reasons, although I explained to her that this method was indicated to stimulate return of function. I agree with those who have spoken that the Galvanic current is valuable in these cases.

Like Dr. Dabney, I was surprised to find by the literature that a number of authorities are quoted as advising immediate mastoid operation in these cases, and they say it is just as urgent as in Gradenigo's syndrome.

Myeloid Leukemia.—In their study of leukemia, Reco and Casas observed two rare phenomena, which they assert have not previously been reported. The first of these phenomena was observed in an experiment based on the rapid disappearance of foreign elements from an animal's circulation when citrated blood from leukemic patients was injected into it. The experiment showed that the injection of citrated blood (which in mammals does not modify the morphology of the blood) into chickens produces a hyperleukocytosis, greater than that which has been obtained in the experimental study of infections or intoxications. This phenomenon, they believe, suggests that in the blood of leukemic patients there must be some hormone or leukopoietic stimulus which determines the hyperleukocytosis. The second phenomenon is the appearance of myeloblasts. They are very numerous in the first weeks in myeloid leukemia, then diminish, and finally disappear in the final stages of the disease.

RECURRENT BREAST TUMOR IN A MALE*

By L. WALLACE FRANK, A. B., M. D., F. A. C. S., Louisville.

Patient, C. McC., a male, aged 65 years, appeared for examination and advice March 21st, 1929. He gave the history of having had headaches at intervals all his life, and had always been constipated. He stated that his appetite had been good, no indigestion, but for the past three weeks has had an "uneasy feeling" in the epigastrium. For the last three or four days he had been slightly nauseated but had not vomited. Constipation about the same as it has always been. Ordinarily he has slept well, but for the past few months has been considerably disturbed by dreaming and noticed that he tired easily.

Present complaint dates from September, 1928, when he started on a hunting trip. He was riding on the right side of an automobile in the rear seat with his arm out of the window holding a dog on the running board. Two days later he noticed a slight bruise in the right pectoral region above the nipple. Fourteen days later a small lump appeared at this site. He said it seemed like a small string underneath the skin and was movable. This caused no immediate discomfort but slowly enlarged. Early in December he noticed that his clothes caused irritation when they came in contact with the area described. Prior to that time he had no pain, no burning, no sensation of a bruise.

On December 6th, he was operated upon under local anesthesia, the involved area above and to the right of the nipple being excised, and subsequently roentgen-ray treatment was used. The operative scar was about two inches above the right nipple and one inch outside the mammary line.

Four weeks ago he noticed an enlarged gland in front of the left ear. About the same time a lump appeared in the region of the eleventh rib on the left side, and another one on the left side of the back.

On examination we found, in addition to the lump in front of the left ear, there was an elevated and thickened area about the size of a silver quarter in the region of the right ear. It was not tender, the skin was fixed over it but showed no discoloration. In the mammary line at about the eleventh rib on the left side was a tumor the size of a hickory nut, bluish in color and definitely raised, but not tender. On the left side of the abdomen about on a line with the umbilicus was a much smaller area which showed no discoloration, the skin was not elevated. The tumor was apparently the size of half a pea, it was discernible on palpation but not on inspection. In

*Read before the Louisville Medico-Chirurgical Society,

the left scapular region was an area somewhat larger in which the skin was also involved. In the right scapular region was a mass almost the size of the one at the eleventh rib. This had not been noticed by the patient. There were definite glandular enlargements in the right axilla. The liver showed no enlargement. The man had no cough nor bloody expectoration, but on roentgen-ray examination we found a definite mass in the right lung measuring about 2 by 2½ cm. It was not on the surface of the lung apparently. The lateral roentgenogram shows a space of three-fourths of an inch between the anterior lung margin and the tumor mass. The space between the posterior lung margin and the tumor is considerably greater.

A retrospective survey of this case shows that, so far as treatment is concerned, there was nothing to be done. So far as diagnosis goes, it is difficult to arrive at a definite conclusion. A pathological examination of the specimen removed in December showed adenocarcinoma of the breast. We cannot very well disregard the cellular pathology, yet we must consider the fact that here is a lesion that has unquestionably infected the blood stream, that the man has metastatic lesions on the side opposite to the primary tumor, he has a large mass in his right lung, and the question arises whether or not the original growth was really an adenocarcinoma of the breast. The location was rather high for mammary tissue in the ordinary male subject. My own conclusion is that the man probably had a sarcoma of the breast originally. Of course, as already stated, it is difficult to decide against the pathological diagnosis, yet with masses in the left side of the abdomen, in the lung, enlarged glands in the right axilla,—which were not nearly so much involved as the skin lesions—one may question the pathological report. We know that carcinoma as a rule extends by the lymph stream and especially in mammary carcinoma we find that extension is in the area of the lymphatics with secondary lesions that are much further advanced than in other parts of the body. This case also raises the question as to the relationship of traumatism as a causative factor in the production of malignancy.

DISCUSSION

J. Garland Sherrill: Dr. Frank has presented a case of unusual interest. The first thing to be considered is the question of the part played by the trauma. I doubt very much whether trauma was a causative factor. The probability is that the lesion was present and the injury merely called attention to it.

It is not beyond the bounds of reason to consider that the patient originally had a mammary carcinoma with metastasis first through the lymph channels into the lung, and subsequently

infection of the blood vessels and metastasis through the blood stream.

I reported before this society at one time, the case of a young woman who claimed not to have discovered a tumor in her left breast until four days prior to being seen by her physician. She was brought to me the next day. Within a week from the time of its discovery the small lump had increased to the size of an orange. Realizing the rapidity with which malignancy progresses in young people a wide radical excision was made followed by radiation. The growth recurred in a short time and traveled like wildfire. Dr. Frank's patient probably has adenocarcinomatosis. It is known that sarcomatosis may also occur. Little is known as yet about the actual life history of these neoplasms. It is possible there was a so-called "rest" in the lung in the case reported, and that was the site of the original tumor. It may be the trauma to the chest localized the growth, but that is not the usual history. It is more reasonable to consider that the man first had a growth in the breast, which had already infiltrated into the chest and the injury simply called attention to it. The roentgen-ray is an extremely valuable means of determining in some cases whether operative intervention should be advised. Had the mass in the chest in this case been seen early, the probability is the patient would not have gone to operation. I have had roentgen-ray used in quite a number of breast cancers in women and must confess it has not helped materially in recurrences in the chest. When there is a recurrence soon after the operative procedure, even then we are not always able to detect it, although it must have been present at the time. We do not invariably get a shadow in recurrences in the chest. That occurs more frequently in sarcoma than in carcinoma. There are a few cases on record where a tumor of the chest in one portion showed sarcoma and in another portion adenocarcinoma. These are the types of tumor that we have in combination.

Louis Frank: The case reported is exceedingly interesting. There are several things which enter here. Just what part trauma may have played in production of the lesion is questionable. As stated by the reporter, the variety of the tumor is uncertain. It may be sarcoma, or it may be an adenocarcinoma. My reason for not accepting the pathological report of adenocarcinoma was the location from which the tumor was excised and other conditions present. We know that cancer of the male breast is rather infrequent. This man's mammary tissues are perfectly movable; the scar above and to right of the nipple is normal and the skin is movable on the pectoral muscles; this would be against extension of the tumor through the tissues into the chest because that would necessarily mean involvement of the lymphatics. I can hardly make this coincide with the type of tumor reported by

the pathologist. At the same time the lesion in the chest is probably secondary. I hardly think a primary growth in the chest would produce such a variety of external manifestations. Yet these growths are not quite as diffuse as they are in sarcoma; in sarcoma there may be hundreds of them. These small external growths do not involve the small lymphatics of the skin, they are under the skin and the skin moves over them. Carcinoma is carried through the lymphatics and may produce metastatic growths anywhere; sarcoma travels through the blood stream and may produce a secondary growth in the blood vessels. If this were a carcinoma there would likely be a greater amount of visceral involvement than is present. Unquestionably the man has malignant disease, whether carcinoma or sarcoma I am not prepared to say. The man is rapidly losing weight and strength.

Dr. Sherrill mentioned an important point which may have some bearing on this case, that is the fact that adenocarcinoma and sarcoma may occur simultaneously in the same individual. I operated upon a woman six years ago for a mammary tumor thought to be benign because of the atypical symptoms of malignancy. The growth was freely movable, unattached to the skin, there was no infiltration, the nipple showed no retraction. Yet when the tumor was exposed, it appeared macroscopically malignant and the breast was radically excised. Pathological examination showed a mixed adenocarcinoma and sarcoma of the breast. The growth promptly recurred locally and the secondary lesion was widely removed. I saw the woman two months ago, about six years after the operation, and there is no evidence of further recurrence or metastasis.

I also agree with the point made by Dr. Sherrill that it is well in all cases to make a roentgen-ray examination just before operation for mammary carcinoma, because we do sometimes find metastases into the chest thus making operation hopeless. It is also worth while to examine the long bones by means of the roentgen-ray to determine the presence or absence of metastasis. Last year at the Middlesex Hospital, London, in discussing the matter with Mr. Berkeley, he said in that institution they always made an x-ray examination of the chest and also the long bones before operation for mammary carcinoma to determine whether metastasis had occurred. Metastasis in the long bones may be present at the time operation is performed and without this precaution remain undiscovered until later when the interpretation may erroneously be that we are dealing with a bone recurrence or metastasis.

L. Wallace Frank, (in closing): My conception that the tumor in question is not an adenocarcinoma of the breast does not seem to me to be so far fetched. We know that a man has not very much breast tissue, and in an individual 65 years old this tissue has undergone atrophy.

Moreover, the operative scar two inches above and to the right of the nipple is somewhat outside the usual location of mammary tissue in the male.

When we consider the fact that this man is apparently well above the average in intelligence, that he was perfectly well when he started on a hunting trip and received a slight bruise of the pectoral region, and later developed a string-like lesion underneath the skin in that area, I think we can definitely conclude that trauma was a causative factor in this case.

My reasons for presenting this case are: First, that trauma was a causative factor; second, that a malignant tumor in the male breast is rather unusual.

The patient died about four weeks after consulting us.

TUBERCULIN IN THE TREATMENT OF BRONCHIAL ASTHMA*

By OSCAR O. MILLER, Medical Director Waverly Hill Sanatorium and Free Tuberculosis Dispensary, Louisville.

Bronchial asthma is a condition characterized by periodic attacks of paroxysmal dyspnoea; chiefly expiratory in nature, incited by the inhalation or ingestion of certain allergins to which the individual is sensitized. The condition is often associated with hay fever or allergic coryza and bears some relation to eczema, urticaria and angioneuratic oedema. There are in the main, two types, the allergic, of whom 70 to 85% are sensitized to certain proteins and animal emanations, and the non-allergic in whom no specific allergin is implicated. It is conceivable that the latter may have lost a previous sensitiveness, and that bronchospasm has become a habit to such an extent that asthmatic attacks may be provoked by the slightest coryza, or bronchitis. While bacterial sensitization may be a mooted point, and difficult of proof, there is sufficient evidence to hand that it is a factor, and possibly the principal exciting factor in the nonallergic group. In many of these the asthmatic attack is preceded by a cold or bronchitis for from one to several days. The paroxysm having been precipitated it has a tendency to become protracted. In the interim there is evidence of pathological changes in the lungs such as chronic bronchitis, and emphysema that further characterizes the non-allergic class. There is no seasonal prevalence in this type, and the average age is more advanced than in the allergic group. "As the age of onset increases, the frequency of sensitization decreases." In the allergic asthmatics, particularly those due to pollinosis of whom there are about 25%

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among asthmatics there is a seasonal incidence, and in the remainder, the attacks occur on exposure to the specific emanations or the ingestion of the offending foods. In the allergic class the average is much younger, and the respiratory tract shows no evidence of pathological changes between the paroxysms. Should the attacks continue and become chronic, such changes are ushered in and with advancing years this group merges with the non-allergic.

Toxemia is a prime etiological factor according to some writers. Adams (1), of Glasgow, is a staunch proponent of the toxic theory. He affirms that 90% of the asthmatics have manifest dietetic errors and that 70% have nasal lesions. He claims 66% cures by his method, irrespective of the duration of the disease; and marked improvement in 23% of his cases. His treatment consists mainly of diet, exercise, regular mercurials and attention to sepsis, especially in the nose. He calls attention to the relief of asthma in many during active war service, due to the rigorous life, enforced exercise and plain diet, and its recurrence after demobilization. Burton Haselton (2), and La Forge, of Chicago, hold similar views. They especially stress the ethmoid area of the nose and consider it the asthmogenic zone. "It is a clinical fact," they say, "that the ethmoid labyrinth may be, and frequently is, both the source of toxic absorption (or one of its sources) and the exciting end organ."

In the conduct of a tuberculosis clinic one is primarily dealing with chronic respiratory infections. It is natural that a number of asthmatics will eventually find their way into such a chest clinic: particularly the chronic asthmatic, that already has associated a chronic bronchitis and emphysema, and occasionally bronchiectasis and cardiac hypertrophy. Such patients are likely to have a persistent shortness of breath between their asthmatic attacks. They belong in the main to the non-allergic group and in the majority of cases form the basis of this report. Some of them had previously been tested by others for protein sensitization with negative results. A few have had routine x-ray examinations of the sinuses but little pathology has been visualized on the films. All have had a careful physical examination and most an x-ray of the chest. In our earlier work we were struck with the marked similarity in the x-ray findings in the asthmatic chest and those observed in the so-called peribronchial or peritruncal tuberculosis. In proportion to the age there was a definite increase in the density of the hilum shadows, with a perceptible increase in the linear markings which extended well into the apices and parenchyma, and rarely there was evidence of an old healed

minimal tuberculosis. This was one of the reasons that led the writer to the use of tuberculin in the treatment of this condition.

In February, 1923, a patient presented himself with a history of bronchial asthma. His wife had been examined and found to have active tuberculosis. In 1922, Sewell (3), and Gutstein reported their experiments "On the effects of rebreathed air upon normal and tuberculous guinea pigs" in which they were able to sensitize the animals and on subsequent re-exposures to expired air produce in them typical anaphylaxis. It occurred to the author that since this individual slept with his tuberculous mate and that his attacks occurred at night, he may in a measure be sensitized to some protein in his wife's exhalations. On this assumption it was determined to attempt to desensitize him by a course of tuberculin injections. The results achieved exceed our expectations, and though the procedure was based upon a wrong premise in this particular case, that of sensitization, it justified its use, somewhat hesitantly in other cases that had been the usual rounds without benefit, and in these, marked relief followed and in many an apparent cure. There is nothing specific in tuberculin therapy, and it must act as a non-specific foreign protein. I am satisfied that its use and value must have become known to a number of other workers independently; for since its use in our clinic in 1923 several references have appeared in the foreign literature and for all I know others may have antedated me by many years. Though the procedure was conceived independently there is no attempt here to claim priority, but merely to record results in the hope that it may be given an extensive trial and that it may continue to prove useful.

In 1927, Klewitz (4), reported 130 patients with arthritis and some with asthma treated with tuberculin. In 1928, Ling (5), reported 24 children with asthma treated with tuberculin; he did not exceed one one-hundredth of a milligram of tuberculin; three were unaffected, two discontinued treatment, nineteen were definitely improved and a cure effected in two. Children belong in a greater degree to the definitely allergic group, in whom one would expect to get indifferent results with tuberculin therapy. M. Arjeff (6), in 1924, treated 20 cases of bronchial asthma with tuberculin with indifferent results. Rackemann (7) and Scully treated 346 cases of asthma with vaccines with good results in 74% of the cases. Some investigators have successfully treated cases of asthma with typhoid vaccines; in many of the patients so treated, severe local and constitutional reactions occur that are exceedingly unpleasant. In tuberculin we have an agent that is ideal for this purpose,

because of the absence of reactions, and the exactitude with which the dose may be measured and administered. The ascending dosage is proportionate throughout the series. The type of tuberculin used in the treatment of these cases was Bouillon Filtrate (Denys) (PD&CO). This is a tuberculin prepared without heat; and contains all the toxins elaborated in the growth of the tubercle bacilli in bouillon. Since it is the tuberculin we use routinely in the treatment of selected cases of tuberculosis, it was a natural sequence to resort to it in the treatment of asthma and in exactly the same dosage. It is quite logical to infer that any other tuberculin in appropriate dosage would bring about comparable results. The dilutions are easily prepared; but should not be kept longer than two or three weeks, as tuberculin deteriorates rapidly after being diluted.

The tuberculin was reported in five dilutions, as set forth in table 1. No. 5 contains 1 thousand of a milligram to each cubic centimeter. The following dosage (8) was used: 0.1cc, 0.15cc, 0.22cc, 0.32cc, 0.47cc, 0.68cc, 1. cc The initial dose represents one ten-thousand of a milligram of tuberculin. The injections are given twice a week and continued through the whole series. In young children it is advisable to stop on No. 2 dilution, which represents one milligram to each cc; and in adolescents, it would be well not to exceed 0.4cc No. 1 or four milligrams of tuberculin. Redness or soreness at the site of injection is indicative of a local reaction and when this occurs the dosage should not be increased; either repeat the last dose or drop back. In all of our cases a complete physical examination and an x-ray of the chest was made; and this obviated the possibility of provoking a constitutional tuberculin reaction. The x-ray of the chest in children is a necessity for this reason. Twenty-four patients in all were treated; five discontinued treatment early, 4 of these were unimproved and one improved, of the 19 who completed their treatment, 4 received no appreciable benefit, 15 or 79% were greatly relieved or cured. Six of our cases were of the mild to moderate hypertensive class either at the time of treatment or have become so with the lapse of time. One would hardly expect any of the so-called cardiac asthma, to respond to protein therapy, since these are what Khana calls

"respiratory centre asthmas," due to a central anoxemia, as a result of a deficient arterial systemic circulation. All of these patients, however, received definite benefit except one and he discontinued treatment. In future cases we propose to give two series of injections with an interval of about two months between by this means hoping to decrease the number of relapses.

CASE REPORTS

Tuberculin in the Treatment of Bronchial Asthma.

No. 12,949—Mrs. N. M., female, age 55. Patient was examined May 9, 1922. Diagnosed as negative for pulmonary tuberculosis, she has chronic bronchitis. Blood pressure 118-72-46. May 9, 1922, patient started on Vancotts vaccine given five doses in all. No relief obtained. Patient very short of breath with severe coughing spells. Slight edema of extremities at time. May 5, 1926, patient put on No. 5 tuberculin. Finished series September 7, 1926. Marked relief; at intervals patient was able to continue at her work as seamstress in a clothing factory. October 19, 1926; Patient again started on No. 5 tuberculin for mild attacks of asthma. Finished second series March 11, 1927. Again patient experienced relief. January, 1929, patient reports she is free from asthma, feels good, and works every day.

No. 26,140—E. R., colored female, age 18. Negative for pulmonary tuberculosis; September 21, 1928, (marked bronchial asthma) Put on No. 5 tuberculin. Took No. 5, has not received any relief. Had taken all of No. 5. Patient very sick and admitted to City Hospital November 4, 1928. In hospital about 10 days—discharged. Continued with tuberculin. November 27, 1928: Very much better. Improvement was maintained. Patient rested well at night. January 3, 1929: Much improved. Last dose taken, was tuberculin No. 3 dose .02 Mg. Patient lost.

No. 11,936—N. S. male, age 39. Negative for pulmonary tuberculosis. X-ray report January 2, 1923, shows roots heavy. Patient gives history of having bronchial asthma since age of 5. X-ray of sinuses reveals them all clear. Put on tuberculin No. 5, February 28, 1923. March 14, 1923, patient reports having a severe attack of asthma. March 21, 1923 feels better than he has in a long time. Cough

TABLE I.
TUBERCULIN DILUTIONS AND DOSAGE

Bottle 1	+	9.9 Normal Saline		0.1cc Tuberculin B. F.	1cc	=	10 Mg.
Bottle 2	+	9cc " "	+	1cc From No. 1	1cc	=	1 Mg.
Bottle 3	+	9cc " "	+	1cc From No. 2	1cc	=	0.1 Mg.
Bottle 4	+	9cc " "	+	1cc From No. 3	1cc	=	0.01 Mg.
Bottle 5	+	9cc " "	+	1cc From No. 4	1cc	=	0.001 Mg.

Dosage for each series beginning with No. 5
.1cc .15cc .22cc .32cc .47cc .68cc .8cc 1cc

is better and only has a mild attack of asthma. Did not finish course of tuberculin. Only took through No. 3. June 21, 1923, patient feeling very much better. Never has had any more attacks of asthma since he has had bedroom windows open. January 25, 1929: Patient reports that he has never had any more attacks of asthma since finishing course of tuberculin. Blood pressure: June 5, 1923, 125 - 80 - 45.

No. 13,211—Mrs. L. R., female, age 47. September 19, 1925: Negative for pulmonary tuberculosis. Gives history of bronchial asthma, for past two months. X-ray September 23, 1925, shows roots heavy. Put on No. 5 tuberculin November 3, 1925. Patient did not get any relief from tuberculin. Did not finish course, as she left town. Blood pressure: September 19, 1925, 123 - 94 - 29.

No. 14, 062—W. H., male, age 65. Examined February 27, 1923. Negative for pulmonary tuberculosis. Complications: emphysema and bronchial asthma. Gives history of having cough and shortness of breath for one year previous to examination. Blood pressure 134 - 74 - 60. X-ray March 8, 1923: Roots heavy. Urinalysis: Sugar negative; albumin, a distinct trace; specific grav. 1012; January 30, 1925. X-ray of sinuses: Radiogram of the accessory nasal sinuses show marked increase in density in both maxillary sinuses and a suggestion of haziness in the frontal sinuses. The ethmoidal cells are apparently clear. March 29, 1923: Patient put on No. 5 tuberculin. Finished No. 3 tuberculin June 6, 1923. Very slight improvement. Again put on No. 5 tuberculin January 29, 1925, only took three doses. Patient failed to come to clinic regularly. Felt that he had really received no benefits from tuberculin.

No. 14,855—Miss S. S. M., female, age 26. Examined August 1, 1923. Pulmonary tuberculosis, minimal arrested. Gives history of bronchial asthma since age of nine months. X-ray, August 2nd, 1923: Roots heavy. Blood pressure: August 1, 1923, 90 - 60 - 30. Put on tuberculin March 5th, 1924. After taking 8 doses reports her health is infinitely better, and says it had worked a miracle with her. Finished series of treatment July 24, 1924. Feeling greatly improved, not having had an attack of asthma for past month. In the past year gained 19 pounds in weight. December 24, 1924, patient again put on tuberculin, for mild attacks of asthma, taking 8 doses in all. Very much relieved. January 25, 1929: Called patient on phone, reports at intervals, she has gone two and three years without an attack of asthma. When younger, she would have the spells in the summer but in the last few years years, all of her attacks have been in the winter. At present, attacks are much less severe than formerly.

No. 17,653—M. D., female, age 41. Examined April 28, 1925; negative for active pulmonary tuberculosis, provisional hilum tuberculosis, and bronchial asthma. Blood pressure: April 28, 1925: 165 - 85 - 80. X-ray May 6, 1925: Showed roots moderately heavy. Patient gives history of cough for the past two years. Put on No. 5 tuberculin October 31, 1925. Finished No. 3 tuberculin January 27, 1926. Patient obtained only very slight relief and failed to come for tuberculin as advised (worked every day).

No. 17,756—Mrs. M. L., female, age 40. Examined May 7, 1925: Negative for pulmonary tuberculosis, had bronchial asthma. Blood pressure: April 28, 1928: 132 - 110 - 22; December 1, 1928: 153 - 106 - 47. X-ray December 3, 1928: Capillary Fibrosis. Patient gives history of having had asthma for 14 years. Patient put on No. 5 tuberculin May 7, 1925. September 3, 1925: Finished series of tuberculin, with complete relief. Patient gives all the credit for relief to tuberculin. October 11, 192: Had a mild attack of bronchitis and slight bronchospasm. Apart from this attack, patient is apparently well.

No. 18,324—W. S., male, age 39. Examined September 15, 1925: Negative for pulmonary tuberculosis, bronchial asthma. Had bronchial asthma all his life. Put on No. 5 tuberculin. Only took four doses. Did not get any relief. Stopped coming for treatment. June 24, 1926: Patient has severe heart and dropsy condition. Occasionally has attack of asthma.

No. 6,578—Mrs. M. N., female, age 36. Blood pressure February, 1925: 88 - 60 - 28. X-ray October 5, 1921: Shows fusing of hilus shadows, old hilum tuberculosis. Heart apparently normal. Patient gives history of asthma from age of 2 years. Put on tuberculin No. 5 November 1, 1925. Patient suffering severely with asthma. Patient began to improve after first few doses of tuberculin. Finished taking first series March 23, 1926. Attacks less frequent and severe. At this time patient scrubbing at night and taking care of family of two children at day. November 23, 1926: Patient again coughing and having attacks of asthma, but not so severe. May 24, 1927: Patient put on tuberculin No. 5. Patient did not get much relief until taking No. 3 tuberculin. Finished second series of tuberculin December 6, 1927. May 10, 1928: patient doing own work and feeling much better. May 29, 1928: Patient moved—unable to locate. Still has mild attacks of asthma.

No. 18,583—Mrs. L. H., female, age 48. Examined November 9, 1925: Negative for pulmonary tuberculosis. Patient reports having asthma since age of 17 years. Patient put on No. 5 tuberculin December 18, 1925. Only

took four doses. Did not get relief. Patient lived in country and did not return.

No. 19,310—Mrs. K. F., female, age 39. Examined April 7, 1926: Negative for pulmonary tuberculosis, bronchial asthma. Blood pressure 130 - 108 - 22. Put on No. 5 tuberculin April 19, 1925. Only took three doses. Did not get any relief—did not return to Dispensary.

No. 19,371—Mrs. E. H., female, age 47. Blood pressure April 29, 1926: 188 - 118 - 70. May 22, 1927, blood pressure: 200 - 108 - 92. Urinalysis negative. Patient had asthma since two years of age. Patient put on tuberculin No. 5, April 29, 1926. May 24, 1926 patient reported much better. July 26, 1926: Had attack of asthma. July 29, 1926: Had attack of asthma; August 10, 1926: Tuberculin No. 3—8cc was given. Patient somewhat improved. Moved and did not return to Dispensary until May 24, 1927. Again put on tuberculin No. 5. June 16, 1927. Patient says tuberculin seems to help her much better than anything she ever had. Feels much better. June 23, 1927, No. 4 tuberculin—.22 Mg. Blood pressure: 188 - 102. Discontinued tuberculin and referred to Medical clinic. December 30, 1927: patient had stroke of paralysis three months ago. Patient is in rolling chair all the time. Is not bothered very much with asthma now. July 11, 1928: Patient again complained of severe attacks of asthma. Put on tuberculin No. 4—.01 Mg. July 11, 1928: Took No. 4, No. 3 and No. 2 and finished on October 2, 1928. Is very much improved. Patient moved out of city.

No. 19,414—Mr. F. C., male, age 45. Examined May 6, 1926: Negative for pulmonary tuberculosis. Bronchial asthma. Blood pressure 136 - 80. Gives history of attacks of asthma whenever he takes cold. May 11, 1926. Put on No. 5 tuberculin. May 21, 1926: Patient not feeling any better—had slight cold. July 23, 1926: Patient feeling better—had slight attack of asthma each day late in the evening. September 7, 1926: Patient on No. 3 tuberculin, has slight attack of asthma almost every night. Patient failed to return for any more tuberculin. November 8, 1928: Nurse called at home—family reports patient working every day and not having any attacks of asthma.

No. 23,005—Mr. H. C. S., male, age about 40. Bronchial asthma, duration not recorded. Put on tuberculin July 1, 1926, and 7 weeks after beginning had attack of asthma. Patient feeling well after 13 doses of tuberculin. Finished No. 3 tuberculin September 29, 1926, greatly improved. September 13, 1927: Friend reports patient has entirely recovered from asthma. Has not had any attacks since last dose of tuberculin given September 29, 1926. Works every day. January, 1929, pa-

tient phoned, said he had no further attacks of asthma.

No. 20,813—L. S., male, colored, age 42. January 3, 1927: Negative for pulmonary tuberculosis, asthmatic bronchitis. Blood pressure January 12, 1927: 142 - 74 - 38. Put on No. 5 tuberculin. While on tuberculin had severe attacks of asthma January 17, 1927. January 31, 1927: Patient reports he is much better, attacks not so frequent. Finished course of tuberculin April 29, 1927. Patient says he has wonderful benefit from tuberculin, but still has light attacks of asthma. Says this is the first winter in three years that he was able to keep to his work.

No. 21,309—D. L. G., male age 57. Examined February 24, 1927: Negative for pulmonary tuberculosis. Has bronchial asthma and emphysema. Blood pressure 160 - 102 - 58. Past five years (since 1922) patient gives history of cough and shortness of breath. March 3, 1927: patient put on No. 5 tuberculin. Patient had some relief at intervals. Only took No. 5, No. 4 and part of No. 3. Did not feel that he had been greatly benefited by tuberculin and stopped taking treatment. X-ray: old hium juvenile tuberculosis. Sputum examination negative for Tubercle Bacilli.

No. 21,577—W. F. S., male, age, 55. March 29, 1925: Negative for pulmonary tuberculosis; has bronchial asthma; hypertension provisional myocarditis. Blood pressure March 29, 1927: 170 - 106 - 54. Pulse 106. Patient put on tuberculin March 29, 1927. After taking four doses reports feeling better than he had in several months. May 21, 1927, patient reports feeling better than he had in years and working every night. June 25, 1927: Patient finished No. 3 tuberculin. Is working full time. Feeling fairly well—did not gain any weight. December, 1927, return of asthma—apparently free for nine months.

No. 22,098—Mary H., female, age 13. Had asthma all her life. Beginning of treatment, patient was 6½ pounds underweight. In 13 months gained 20 pounds and is now 2 pounds underweight. X-ray showed normal density of root. Heavy streamers to zone 3 with peribronchial beading. Gohn's Primary Tubercle. Positive for Juvenile tuberculosis. Put on No. 5 tuberculin: May 28, 1927. After June 28, 1927, patient reports attacks not so frequent. Patient started improving after first doses of tuberculin were given—continued to improve and gained weight. Took No. 5, No. 4, and No. 3 of tuberculin—finished treatment, August 3, 1927 and has not had any more attacks since. From May 21, 1927 to June 16, 1928, patient gained from 65½ lbs. to 85½ lbs. (in 13 months).

No. 23,128—Mrs. B. K., female, age 28. Examined October 1, 1927, negative for pulmonary tuberculosis; has bronchial asthma.

X-ray: Negative tuberculosis: Roots heavy. Gave history of asthma for the past six years. Patient's husband is baker; odor from Wesson Oil when frying doughnuts precipitates attacks of asthma. Patient has been in Arizona and Michigan; gets relief, but asthma returns when in Louisville. Put on No. 5 tuberculin. Took No. 5, No. 4, and No. 3. Did not get great relief from tuberculin.

No. 22,836—Mr. M. S. C., male, age 26. Reported at clinic August 25, 1927. Complains of hay fever which began in 1924. Since then he has had tonsillectomy. In 1925, had several nasal operations for polypus. His hay fever has continued without relief. Patient offered tuberculin but not promised any relief. Began August 25, 1927. By September 9, 1927, was feeling very much better. Completed tuberculin. Feels well. Reported at the Dispensary following year, July, 1928. Said he was greatly relieved of hay fever after taking tuberculin and is anxious to start back before his hay fever begins. Started on tuberculin, .0001 milligrams. Patient reported that his arm became very swollen, inflamed and sore after first dose of tuberculin. Tuberculin continued twice weekly. August 14, 1928 had slight attack of hay fever. Last dose of tuberculin August 17, 1928. Patient became ill with hay fever in about two weeks. Evidently this patient received sensitizing dose on the first injection. Note: X-ray: Negative for pulmonary tuberculosis. Marked capillary fibrosis. Both roots heavy and fuzzy.

No. 22,447—M. R., female, age 51. Asthma and pleurisy began two years previous, 1925. Urinalysis: January 7, 1928: Faint trace of albumin. Micro: Negative—Three sputums were negative for T. B. Put on tuberculin October 14, 1927. Patient very sick in bed at this time. Temperature 98.4°. November 5, 1927: temperature 100.6°. Patient reported she had been running temperature for several days—no relief from asthma. November 29, 1927: Patient seemed somewhat more comfortable. December 9, 1927: Tuberculin No. 4—.8cc was given = .008 Mg. Following this patient said she had headache, nausea, and temperature rose to 102 after taking tuberculin. December 20, 1927: Patient feeling much better and has not had rising temperature for over a week. December 23, 1927: Patient staying in bed most of the day. Said attacks were less severe and less frequent. Gave tuberculin No. 3—.1. April 3, 1928: Patient finished series of tuberculin. Is feeling fairly well, has occasional attacks of asthma, but is able to be out of bed and do part of the house work, goes out every few days now. Much improved. September 29, 1928: Patient out when nurse called. Sister said she is doing nicely. Attacks of asthma

very rare and not so severe.

No. 25,582—E. G., male, age 19. Negative for pulmonary tuberculosis, history of asthma. Illness began one month ago with cough. Put on tuberculin September 5th, 1928. October 6, 1928: Patient on No. 3 tuberculin—feeling much improved, looking better, and has gained about 9 pounds.

No. 16,485—W. J. B., male age 44. Patient examined August 23, 1924—Negative for pulmonary tuberculosis. Asthma. Blood pressure 104 - 78 - 26. X-ray of chest October 4, 1924: Small drop heart. Root moderately heavy. Moderate streamers to 3rd zone. Negative for pulmonary tuberculosis. January 9, 1925, x-ray of nasal sinus shows considerable increase in density in the left maxillary sinus. Re-x-ray July 23, 1927, negative for pulmonary tuberculosis. Roots heavy. Patient states that he had been tested for the various proteins with negative findings. His chief complaint, August 23, 1924 was cough, shortness of breath. Said he has had asthma since 1916. Started on tuberculin August 23, 1924. October 15, 1924 had slight attack. October 18, 1924 had a milder attack. Still on No. 5 tuberculin. On November 5, 1924, had severe attack of asthma and had to take 3 doses of adrenalin. November 8, 1924, feeling better. October 19, 1924, had severe attack of asthma. Awakened Sunday morning with an attack, which has lasted all week. These attacks usually being at the end of the week. Takes tuberculin on Saturday. Has had no attack Thursday following his tuberculin. He is in the habit of taking a pill every Saturday night. (Calomal, rhubarb, colocynth). Later observation showed that he was not sensitive to any of the ingredients of these pills. Sputum was occasionally streaked with blood following attacks of asthma. December 3, 1924, had severe attack of asthma. Began 7:00 A. M. Sunday, lasted until Wednesday. Took five injections of adrenalin. Is still wheezy. At this time is receiving .33 Mg. tuberculin. December 17, 1924, has had no spell since December 3, 1924. January 14, 1925, patient feels fine and has had no further attacks since December 3, 1924. Slight cough of morning but no expectoration. Last dose of tuberculin January 17, 1925, which was one Mg. Patient helped to cut hole through brick wall. Exposed to much dust. Precipitated mild attack of asthma. Took adrenalin, which relieved him. April 19, 1924, had severe attack of asthma which lasted one hour. April 22, 1924, patient requested tuberculin therapy. While on tuberculin he had a severe attack of asthma, during the week of May 16, he took 12cc of adrenalin before he obtained relief. In July he reports that he is feeling well. There are no further attacks of asthma recorded and he finished his tuberculin October 17, 1926.

He returned in July, 1927 for another course in tuberculin. Patient says he is feeling well. Reports no attack of asthma in September, 1927. Finished his tuberculin in November. Last report on this patient October 6, 1928. States that he has very severe attacks of asthma and has to sit up at night. This patient experienced greatest relief after first course of tuberculin.

SUMMARY

Bronchial Asthma is of two types—the allergic and non-allergic.

Toxemia is an etiological factor in asthma in the non-allergic.

Non-allergic asthma responds satisfactorily to foreign protein therapy.

Tuberculin given suitably both as to dosage and time relieves many non-allergic asthmatics for an indefinite period.

Twenty-four patients with bronchial asthma were so treated; 5 discontinued treatment after a few doses, 19 completed the course, 15 or 79% of these received marked benefit and 4 were unrelieved.

The case histories are presented.

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DISCUSSION

John Walker Moore: I have enjoyed Dr. Miller's paper which represents a large amount of work. We know that the morbid physiology of asthma is muscular spasm or edema of the bronchial mucous membrane or the two combined.

From an etiological standpoint we may say that we are dealing with two factors, namely: (1) extrinsic, and (2) intrinsic. The extrinsic factors may be pollen, some form of dust, etc. The intrinsic factors are associated with disease of the various tissues of the body.

In the treatment of these cases we attempt to remove the causative factor involved. For instance, if the patient is sensitive to ragweed and is removed from that locality, within twenty-four hours to a few days he is free from asthmatic attacks. The same may be said of dandruff and other substances.

If the patient is sensitive to horse dandruff and is removed from the vicinity of horses, the symptoms subside within a few hours to a few days, depending on the hypersensitiveness.

If we can remove the offending cause, the asthmatic attacks subside. Where we cannot remove the offending cause, it is advisable to desensitize the patient against the specific protein or what ever it may be, and we have found that it requires the specific protein for desensitization in order to obtain good results. Thus the pollen of June grass will not desensitize against the pollen of ragweed, etc.

If the causative agent be intrinsic in origin, as infected paranasal sinus, gall bladder, appendix, etc., we attempt to remove the focus. Should we be unsuccessful in removing the focus, it is good therapy to desensitize the patient if possible against the specific organism. Non-specific proteins are used at times in this type of work with a fair degree of success. I believe Dr. Miller's success can be attributed to the latter form of therapy.

Leon K. Baldauf: I was very much interested in Dr. Miller's paper. We always hear good things from him. I think the essayist refers particularly to cases of asthmatic bronchitis in contradistinction to cases of true bronchial asthma.

About three years ago we had a very interesting case of asthmatic bronchitis in which the patient had a four-plus Wassermann blood reaction. Antisyphilitic treatment was instituted and the asthma disappeared within a short time.

I think we have heretofore been treating asthmatic bronchitis in a rather "hit-and-miss" manner. It is more than likely that in many of these cases we might use to advantage the treatment Dr. Miller has suggested.

The proper preparation of the vaccine is most important in the treatment of asthmatic bronchitis. We generally collect the sputum which is very thick and tenacious and adheres to the side of the glass container; we put the sputum in the incubator for twenty-four to forty-eight hours by which time it will have become almost liquid. Then we make the vaccine by taking this liquid sputum and pour it into the culture medium. Some of the micro-organisms will grow and in addition we have the proteid from the bronchi, and we make the vaccine from the combined sputum and micro-organisms. We have secured some remarkable results from the administration of this vaccine in the treatment of asthmatic bronchitis. We do not make a culture of the micro-organisms alone but make the vaccine including the proteid of the sputum and the micro-organisms there already.

We are not always certain of our diagnosis of tuberculosis from consideration of the physical signs or otherwise, and I have wondered whether some of the cases diagnosed asthmatic bron-

chitis were really not inactive tuberculosis. The probability is that in some of these cases in which we have secured favorable results from the injection of tuberculin were inactive tubercular and not asthmatic. I have found, in any event, that these patients do much better with vaccine made in the way I have described rather than vaccine made from the micro-organisms alone.

C. H. Harris: In discussing the question of asthma I always relate a very interesting case which occurred in my own family and which impressed me very forcibly with the fact that asthma is only a symptom not a disease. We know that allergy is one of the potent causes of asthma. The case that occurred in my own family demonstrated that in a very interesting manner.

A female child when six years old began having severe bronchial asthma, so severe in fact that many nights her parents remained awake all night treating her with inhalations of nitrites, etc. The attacks began in the late spring, and it was thought the child might be sensitive to some kind of pollen. She was treated by various physicians and specialists in Louisville and Indianapolis with only temporary relief. All the known methods of examination were employed, but no focal cause for the asthma was found.

After about two months the child was taken to Northern Michigan for the remainder of the summer, where she would not come into contact with pollen or other irritating substances. She was completely relieved after being in Michigan for a short time. She remained well all summer and gained in weight. When returning home, between Indianapolis and Louisville, she had a very violent attack of asthma. This continued and after reaching home the parents again began their nightly work with inhalations of various substances. No benefit was derived from the administration of drugs.

Further investigations were made, and it was determined, I think by Dr. Baldauf, that the child was hypersensitive to fats. Urinalysis had always shown a large amount of albumin and acetone. At Dr. Baldauf's suggestion the child was placed on a fat free diet and within twenty-four hours she was free from asthma. She had been in the habit of drinking a large quantity of milk and of course this had to be withdrawn from the diet when it was determined she was sensitive to fats. By the careful use of certified milk, she was gradually desensitized against milk fats and she is now able to take half a gallon daily. Her asthma has entirely disappeared and she has gained in weight.

Considering the foregoing history the reason for this child being free from asthma while in Northern Michigan, and return of the attacks after returning to Louisville, is not difficult of explanation. During the time she was in Michi-

gan, milk was eliminated from her diet because the quality of the milk obtainable there, was uncertain. After leaving Indianapolis on the way home, the child drank a glass or two of milk and shortly thereafter developed a violent attack of asthma.

I have seen many cases of asthma relieved by removing the patient from his home surroundings. As a rule, however, I think recovery from asthma depends largely upon the length of time it has existed. I do not believe anyone ever recovers from emphysema.

I thank Dr. Miller for his splendid paper.

Samuel G. Dabney: I wish to speak only of the relation of nasal diseases to asthma. It seems to be a fact that asthma is often relieved but seldom cured by treating the nasal lesion. I believe that is the general opinion. Ethmoid disease is quite frequently associated with asthma, and I have seen several patients benefited by treating the ethmoid, removing polypi, etc. Operation on the ethmoid cells permits free drainage of the sinus. I recall one man upon whom I operated, opening both the sphenoid and ethmoid, and he received greater relief from his asthma than any other patient I have seen after nasal treatment. He remained free from asthmatic attacks for a long time. There can be no doubt that nasal diseases are often associated with asthma as contributing factors. Many are helped, but few are cured by nasal treatment.

Philip F. Barbour: I was very much interested in Dr. Miller's presentation of a new method of treating bronchial asthma. The question of sensitization of children is a large and important one, and there are many different manifestations. Eczema is many times due to food sensitization and asthma likewise. I am not prepared to say that there are not other causes of asthma besides sensitization. I believe many children who do not respond to the ordinary treatment for asthma, are sensitized. It is a very interesting subject for investigation as to why the location of sensitization should be in the skin of one and in the bronchial tissues of another.

While studying in London some years ago, I heard Dr. George Still say that for some unknown reason, a child with eczema will develop asthma about the age of 20 or 21 years. This was his clinical experience, and we have now an explanation in the matter of sensitization.

Naturally when we find a child sensitized to a protein, we attempt to remove that food from the dietary or in other ways to get rid of the sensitizing agent. In testing children with eczema for the sensitizing protein, we may find that they are sensitive to so many foods that it becomes a difficult matter to furnish proper nourishment to them. We also know that when a child is sensitive to one substance, after a few months or years it will become sensitized to many other substances, and in such cases we may

have to give it food to which it is sensitized to get the proper nutrition disregarding the by-products.

Desensitizing children to food or pollen seems to be only temporary and the results, when the cells of the body have acquired sensitization, are very difficult to remove entirely. When sensitized to horse serum they may be desensitized by the Brudzinski method long enough for the desired serum to be given. When the serum is to be injected, or other sensitizing substances given, it is possible to desensitize the child by gradually increased dosage of the offending agent by mouth, but probably a more efficient way is the parenteral route.

Many of the cases of asthma I have seen have followed an acute nasal condition, and I have been able to afford relief by securing a more normal condition of the nasal passages. I believe many such cases are due to sinus infection, in which event there is possibly sensitization to bacteria or to some other morbid protein matter from the infected sinuses and from the increased discharge of mucus. Cod liver oil in such cases is often of benefit as it lessens the amount of infection in the nasal passages.

I think Dr. Miller has offered an excellent explanation as to why tuberculin ought to be a valuable remedy in the treatment of asthma, but it is possible that the same benefit might be produced by some other non-specific protein. The whole field of sensitization is an exceedingly interesting one for investigation and doubtless we shall find a real therapeutic help when we have gained a more thorough knowledge of its action.

Oscar O. Miller, (in closing): I wish to thank you for the liberal discussion and commendatory remarks. In our chest clinic, the time at our disposal is used in making physical examinations and advising the patients about their general condition, because that is the purpose of our clinic. If disease unrelated to the chest or respiratory tract is discovered, we refer the patient to the medical clinic for attention. We have made no attempt in these particular cases to treat chronic allied affections. Many of the people cannot afford to have carious teeth extracted or filled, the results we have obtained therefore rest on the basis of tuberculin therapy. I am sure if it were possible for us to treat these people for their complications, instruct them in hygienic living, investigate the question of constipation, dietary regulation, and exercise to stimulate the skin, we could obtain infinitely better results.

I was interested in Dr. Baüdauf's report on the vaccine method of treating asthma.

Dr. Dabney spoke of nasal disease in connection with asthma, and stated that nasal operations benefitted a few but a cure of the asthma seldom resulted. I believe that is correct. Possibly one in twenty may be cured. In every case of asthma the nasal passages and paranasal

sinuses should be investigated, and if pathology be found, it should be corrected by the most suitable method of treatment. According to most writers the ethmoid region is involved in asthma oftener than other sinus areas.

As to asthma in children: I think the results will be less encouraging because they belong to the allergic group in a greater proportion than adults.

It is quite true that an individual may have multiple sensitization, and it is also true that sensitization for certain products may affect different areas of the body. In one a certain protein may cause an acute enteritis, in another urticaria, and in still another, asthma, verifying the old adage, "that what is one man's meat is another man's poison." Many of these patients with asthma give a history of having had eczema, in childhood, and about 48 per cent give a family history of hypersensitiveness.

The allergic group is of particular interest. Individuals in this group may be desensitized against certain pollens this season, but next season they are susceptible to the same pollens and have to be desensitized again. They seem to be permanently allergic. This is not true of the non-allergic group because we can desensitize these people and many of them remain so.

As to the question of nasal diseases precipitating an attack of asthma. The nasal passages are a part of the respiratory tract, and quite often bronchial asthma is associated with nasal disease. Many patients have coryza or bronchitis preceding their attacks of asthma.

I am a little dubious as to whether tuberculin will give relief in those individuals who are sensitive to certain protein substances. A number of these have been treated with peptone, by some investigators, and have had severe reactions following the injection.

There are many methods of treating bronchial asthma. We are using tuberculin in the clinic every day and it becomes a simple matter for us to treat bronchial asthma with this agent. The question might be raised about the possibility of producing a constitutional reaction by the injection of tuberculin. This has not occurred in any of our cases because we use the same dose that we do in treating active cases of tuberculosis.

Increase in Mortality from Thrombosis and Pulmonary Embolism.—Fahr points out that there has been an astounding increase in the number of deaths from thrombosis and pulmonary embolism since 1922. The largest proportions of deaths occurred among persons afflicted with cardiovascular diseases. Fahr feels that the increasing use of intravenous therapy may have something to do with this, inasmuch as nothing else has changed in recent years in the clinical history or treatment of these cases.

SPLENIC ANEMIA IN A CHILD*

By JAMES W. BRUCE, M. D., Louisville.

The subject of this report is a child who was perfectly normal until she was four years old. The family history was essentially negative. At the age of four the child had a severe hemorrhage from the intestinal tract. The attack began with pain in the upper abdomen and a rapid pulse rate. A transfusion of citrated blood was given and the hemorrhage ceased within a few hours. She was transfused three times, however, before the hemorrhage stopped; that is to say, she had three attacks of bleeding within a period of four days, each from the intestinal tract, and each controlled by blood transfusion.

The child was carefully examined by a competent physician who found the spleen considerably enlarged and made the diagnosis of splenic anemia. She was taken to the Mayo Clinic where a similar diagnosis was made and splenectomy performed. The surgeon informed the family that, according to his experience, the child would be cured by the operation, but unfortunately the contrary proved true. Within fifteen months there was a recurrence of the hemorrhage which, like the previous attacks, was controlled by blood transfusion.

I first saw the child in September, 1928. She was then bleeding profusely from the intestinal tract and was given a transfusion of 250 c. c. citrated blood. The hemorrhage ceased and she remained free from bleeding for two or three months. All the attacks were attended by pain in the epigastrium. The latter part of December, 1928, she again had a severe hemorrhage. The blood at first was bright red, the color later becoming dark or black. One transfusion controlled the bleeding in both September and December.

After the Christmas holidays the patient was again taken to the Mayo Clinic to determine whether there was anything further they could do. The mother was informed they had found a varicose vein of the intestine which they ligated in one similar case and there was no further hemorrhage. In this case, however, nothing more was done surgically. A personal communication from the Mayo Clinic stated that this child developed intestinal hemorrhages and died 2 years after this operation.

During the evening of March 8th, 1929, I was called to see the child and found she had contracted a septic infection of the throat, first noticed two days before. Her temperature was 103° F. all day Thursday and Friday. Friday afternoon (December 8th) she again began to have intestinal hemorrhage. At this time abdominal pain was general and

within four hours after pain developed, she passed bright red blood from the rectum. She was given a transfusion of 250 c. c. citrated blood which was followed by a severe reaction and had no effect on the bleeding.

At three o'clock Saturday morning she was given another transfusion of 250 c. c. citrated blood. No reaction occurred and she seemed better for a few hours. However, later in the morning she began to bleed again, and I asked Dr. L. W. Frank to give her a transfusion of whole blood. This was done, 600 c. c. of whole blood being given at 11 a. m. Saturday. Her pulse, when she taken to the operating room was 160 to 170, this quickly receded to 100 and she looked much improved. This continued for four hours, when bleeding recurred, and twenty-four hours after the transfusion she was worse than before. It was then decided not to give another transfusion, but to administer morphine by mouth or hypodermatically with glucose by proctoclysis, etc. She apparently did well for forty-eight hours at which time the pulse was of good volume and we thought the hemorrhage was certainly controlled. To be on the safe side, however, Dr. Frank gave her another transfusion of 250 c. c. whole blood. After that there was no more hemorrhage for four days. The following Saturday night about eight o'clock bleeding recurred. We did not believe that transfusions would accomplish any further good, but continued to give her glucose solution. The patient died two days later.

I record this case for several reasons: First, splenic anemia is rather a rare disease, and uncontrollable hemorrhage after splenectomy, in a child is still rarer. Second, splenectomy is the accepted treatment for splenic anemia, and there have been many complete recoveries. The family told me that the Mayos have had 36 cases of splenic anemia in children in which splenectomy was performed, and that this child and one other were the only ones who had hemorrhages following splenectomy. Third, it is uncommon for hemorrhage to occur in these cases after transfusion. That is true in all the transfusions that I have hitherto given. Fourth, in the present case transfusions controlled the bleeding on several former occasions but was ineffective in the last attack.

DISCUSSION

L. Wallace Frank: The report that at the Mayo Clinic they have had few recurrent hemorrhages following splenectomy for splenic anemia in children seems rather remarkable when we consider that in adults recurrence of the hemorrhage is fairly common. So far as I can recall we have seen three such cases. It is not so rare for hemorrhage to occur following splenectomy. Furthermore, of 36 children upon whom splen-

*Read before the Louisville Medical-Chirurgical Society, March 22nd, 1929.

ectomy was performed at the Mayo Clinic, two had recurrent hemorrhages.

As to additional transfusions in the case reported by Dr. Bruce. I could see nothing to be gained by introducing blood at one end and having it escape about as rapidly from the other end. That was why I suggested that no further blood transfusions be given.

The mere fact that one patient has been operated upon and a varicose vessel found which was ligated and the patient recovered, does not mean that other patients have varicose vessels that can be found and similarly ligated with recovery. The child described by Dr. Bruce was very ill and I do not believe such an operative procedure was justifiable under the circumstances. My attitude in this case was about the same as in two cases of aplastic anemia in which blood transfusions were given, namely, that it was worth trying once and if this failed to bring about the desired result and the patient showed no evidence of being able to form his own blood the procedure should be abandoned. If two transfusions fail there is no use in wasting perfectly good blood hoping to save an individual already doomed. In ordinary hemorrhage from the gastro-intestinal tract, after waiting four or five days one would expect the clot to be sufficiently organized to withstand slight pressure.

James W. Bruce, (in closing): I agree with what Dr. Frank has said about blood transfusion. It seems to me that if transfusion is going to accomplish any good, certainly 1000 c. c. of blood given within forty-eight hours should be sufficient. In the case reported, twenty-four hours after the last transfusion the child was in just as serious condition as before. If she had improved sufficiently after the last transfusion to justify hope for recovery, then if acute hemorrhage occurred a few months later the abdomen might have been opened quickly and possibly the varicose vessel found and ligated. That was really the only hope we had.

NEWS ITEMS

Dr. Robert P. Ball announces the opening of his office, 718 Heyburn Building, Louisville, Ky. General Surgery.

Dr. A. A. Shapero announces his return to the city and has resumed his practice with offices at 427 Breslin Building. Practice limited to disease of children and infant feeding. Office hours: 10 to 11 and 2 to 4, and by appointment. Telephones: Office, City 3569; residence, Highland 3890.

Dr. Chas. H. Moore announces the removal of his office to Suite 519 Breslin Medical Arts Building, August 1st, 1929, Louisville, Ky. General surgery.

Dr. William M. McClarin announces the open-

ing of his office for the practice of surgery, 1014 Brown Building, Louisville, Ky.

BOOK REVIEWS

THE INFANT AND YOUNG CHILD. Its care and feeding from birth until school age. A manual for mothers. By John Lovett Morse, M. D., Edwin T. Wyman, M. D., and Lewis Webb Hill, M. D., of Harvard Medical School and Children's Hospital, Boston, Mass. 12 mo of 299 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1929. Cloth \$2.00 net.

This book, written by three Harvard teachers who specialize in the care of children, tells mothers what modern medicine and modern health care can do to keep children healthy. In simple language the authors solve the problems and dispel the worries of mothers. The complete care of the child is directed during the periods from birth to six years.

The disease of infancy and childhood are discussed in such a manner that mothers will know whether the child is ill or not, and if ill, what to do until the doctor arrives. There is modern advice and instruction on clothing, breast feeding, weaning, milk modifications, artificial foods, indigestion, recipes, sleep, exercise, training, emergencies, etc.

Since the first publication of this book there have arisen new helps for mothers, new knowledge to promote baby's welfare. In this New (2) Edition of their book, therefore, the authors give entirely new sections on whole milk modification, green vegetables, poor appetite, sunshine, ultra-violet light, and rickets.

REGIONAL ANESTHESIA—By Gaston Labat, M. D. Clinical Professor of Surgery, University and Bellevue Hospital Medical College, New York City, Laureate of the Faculty of Sciences, University of Montpellier; Laureate of the Faculty of Medicine, University of Paris; Formerly Special Lecturer on Regional Anesthesia; The Mayo Foundation, University of Minnesota. With a foreword by William J. Mayo, M. D. Second Edition, Revised. Octavo of 567 pages with 367 original illustrations. Philadelphia and London. W. B. Saunders Company, 1928. Cloth \$7.50.

Dr. Labat has subjected his work to a very thorough revision, some chapters having been entirely rewritten. In addition 68 new illustrations have been added. New advances new instruments, new technic are all given here clearly and definitely.

WOMAN'S AUXILIARY NOTES REPORT OF THE COMMITTEE ON THE JANE TODD CRAWFORD MEMORIAL FUND

The Woman's Auxiliary to the Kentucky State Medical Association voted September 12, 1928, at its Annual Meeting, to undertake a new project, the development of a fund for the erection of a memorial to Jane Todd Crawford, the pioneer heroine of abdominal surgery.

The project was presented by Mrs. A. T. McCormack, who reminded the members that Dr. Irvin Abell had made the suggestion that the Auxiliary sponsor this memorial in his address at the 1926 Annual Meeting held in Frankfort and that the Doctors McCormack had repeatedly suggested such a memorial to the Women's Clubs of the State, as it seems so fittingly a woman's project. Also, that the original suggestion had come from Dr. Samuel Gross on May 14th, 1879 during his oration at the dedication ceremonies of the monument erected in Danville to the memory of Dr. Ephraim McDowell, by the Kentucky State Medical Association.

However, no definite steps were taken toward this purpose until the vote of the Woman's Auxiliary, September 12, 1928. Then, the President, Mrs. J. T. Reddick, appointed the following committee to develop the plans and further the project:

Mrs. Graham Lawrence, Shelbyville; Mrs. V. A. Stilley, Benton; Mrs. W. M. Martin, Harlan; Mrs. J. T. Reddick, Paducah; Mrs. P. E. Blackerby, Louisville; Mrs. Irvin Abell, Louisville; Mrs. A. T. McCormack, Louisville, chairman.

At the Executive Board Meeting, held on the evening of September 12th, the Memorial Fund was started by contributions of one dollar, each, from the ten following members: Mrs. J. T. Reddick, Mrs. A. T. McCormack, Mrs. V. A. Stilley, Mrs. W. M. Martin, Mrs. G. A. Hendon, Mrs. W. G. Salisbury.

Since that time, a total of \$209.00 has been collected from the following sources:

Mrs. J. T. Reddick, Mrs. A. T. McCormack, Mrs. Wm. M. Martin, Mrs. V. A. Stilley, Mrs. G. L. Thompson, Mrs. G. A. Hendon, Mrs. W. G. Salisbury, Mrs. J. G. Foley, Mrs. J. H. Parker, Miss Lucy Jane Palmer, Mrs. M. L. Dunn, Mrs. Marie Cobb, Mrs. J. N. McCormack, Perry County Auxiliary, Marshall County Auxiliary, Madison County Auxiliary, Mrs. Irvin Abell, Jefferson County Auxiliary, Mrs. G. L. Thompson, Oldham County Auxiliary, Mrs. W. S. Hargrove, Mrs. W. F. Boggess, Mrs. C. Z. Aud, Miss Nancy Aud, Mrs. E. W. Akins, McCracken County Auxiliary, Mrs. E. R. Fitch, Franklin County Auxiliary, Mrs. W. H. Nash, Mrs. Graham Lawrence, Mrs. A. C. Weakley, Mrs. W. P. Hughes.

Mrs. W. G. Salisbury, 1108 Bath avenue, Ashland, Ky., is the Treasurer to whom all contributions should be sent.

No definite form or place for the memorial has yet been determined. It was deemed wise to find out first whether or not sufficient interest

could be aroused to warrant a definite plan. The results of the quiet work of the past nine months show gratifying assurance that women will respond to an opportunity to express gratitude for the humanitarian service of Jane Todd Crawford.

The committee decided to follow the suggestion of Dr. Samuel Gross and make the memorial a woman's memorial with contributions from all over the world. All women, everywhere, are privileged to contribute to this memorial and the names of every donor will be kept in the records.

The committee decided to bring the project to the attention of all the members of the Woman's Auxiliary first, as this organization had voted to sponsor the development. Accordingly, a letter was sent to the President of each County Auxiliary, presenting the project and asking for contributions. More recently, a letter was sent to each member asking for individual contributions. The response has been encouraging and puts Kentucky definitely in the lead in this worthwhile movement.

The project was also presented, November 14, 1928, to the members of the annual conference of the Woman's Auxiliary to the Southern Medical Association (an organization comprising the sixteen Southern States and the District of Columbia) at Asheville, N. C., in the Presidential address of Mrs. A. T. McCormack. Representatives from several of the States favored participation in the project and have, during the past year, presented the suggestion to their State organizations. Plans are now in process of development for a National committee to further the greater progress and growth of the movement.

The committee hopes that the project will be given wide-spread publicity during the coming year and that all women, whether through clubs or as individuals, will participate in this undertaking to express in some measure their appreciation to one of the great benefactors of womankind, a benefactor who was, herself, a woman, unheard and un-sung, yet, whose contribution to the science of the alleviation of human pain, suffering and untimely death has made possible the happy, comfortable, effective lives of countless women throughout the world.

The definite form this memorial will take and the place of its establishment will be fixed by a committee of national recognition. Many have expressed the hope that it might be placed near the statue of Dr. Ephraim McDowell in Statuary Hall in the Capitol at Washington. The Sculptor of that beautiful monument has stated that this is quite possible. And, this gives one pause to ponder, "Would not Dr. McDowell wish it so? Would he not wish the recognition given his epoch-making operation accorded, not to himself alone, but shared by his heroic, unparalleled patient."

MRS. A. T. McCORMICK, Chairman.

Kentucky Medical Journal

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COUNTY SOCIETY REPORTS

Muhlenberg: A reorganization of the Muhlenberg County Medical Society was effected July 25th, 1929, with the following officers elected:

E. L. Gates, Greenville, president; Claude Wilson, Greenville, vice-president; C. G. Crowder, Central City, secretary.

C. G. CROWDER, Secretary.

Nelson: At a meeting of the Nelson County Medical Association the following resolutions were unanimously adopted:

WHEREAS, the Supreme Dispenser of life and death has called from his earthly activities Dr. J. N. Shehan,

Therefore, be it Resolved that we recognize and deplore the loss of one who was faithful, skillful and untiring in the discharge of his professional duties, and,

Resolved, that we mourn the passing of Dr. J. P. Shehan, who in his personal contacts was affable, courteous and intelligent, and,

Resolved, that we extend to his family our deepest sympathy, and that a copy of these resolutions be sent to his family, to the Standard, The State Medical Journal and be spread on our minutes.

Signed:

J. G. POWERS,
EDWARD D. MUDD,
J. J. WAKEFIELD,
R. H. GREENWELL.

Nelson: At a meeting of the Nelson County Medical Association the following resolutions were unanimously adopted:

WHEREAS, the Supreme Dispenser of life and death has called from his earthly activities, Dr. Charles McClure,

Therefore, be it Resolved that we recognize and deplore the loss of one who was faithful, skillful and untiring in the discharge of his professional duties, and,

Resolved, that we mourn the passing of Dr. Charles McClure, who in his personal contacts was affable, courteous and intelligent, and,

Resolved, that we extend to his family our deepest sympathy and that a copy of these resolutions be sent to his family, to the Standard, The State Medical Journal and be spread on our minutes.

Signed:

J. G. POWERS,
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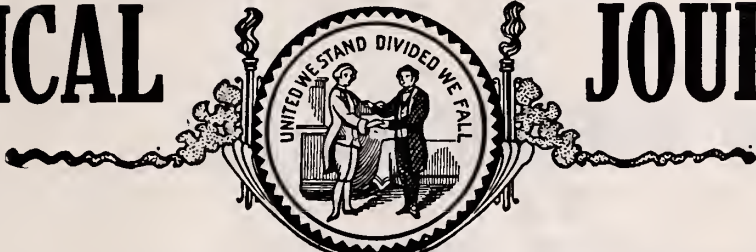
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ANNUAL NUMBER

KENTUCKY

MEDICAL JOURNAL



Being the Journal of the Kentucky State Medical Association

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BOWLING GREEN, KY., OCTOBER, 1929

No. 10

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New-Norris & Landis' Chest Diagnosis



The new edition of Norris and Landis' "Diseases of the Chest and Physical Diagnosis" had to be reset—because *it was virtually rewritten!* It would be impossible in an advertisement to give adequate appreciation of the great amount of new material and the painstaking care which this New (4th) Edition exhibits.

One of the most important features of this new edition is the new chapter on "The Transmission of Sound Through the Chest," written by Dr. Charles M. Montgomery, who is an unquestioned authority on this subject. In other parts of the book you will find large new divisions devoted to x-ray diagnosis, the relation of nasal accessory sinus disease to infections of the lower air tract, the use of the bronchoscope in diagnosis, latent tuberculosis, tuberculosis in children, many additions and improvements to the chapters on the circulatory system.

In the first section of the book the authors present physical methods of diagnosis, training the reader to interpret signs and symptoms through the eye, the ear, and the sense of touch. The second section of the book takes up the actual diagnosis of diseases of the bronchi, lungs, pleura, diaphragm, pericardium, heart, and aorta. There is also a chapter on the "Electrocardiograph," written by E. B. Krumhaar.

By George W. Norris, M. D., Professor of Clinical Medicine in the University of Pennsylvania, and H. R. M. Landis, M. D., University of Pennsylvania, Professor of Clinical Medicine, with a chapter on the Transmission of Sounds Through the Chest, by Charles M. Montgomery, M. D., former Physician to the Phipps Institute; and a chapter on the Electrocardiograph, by E. B. Krumhaar, M. D., Professor of Pathology, University of Pennsylvania. Octavo of 954 pages, with 478 illustrations. Cloth \$10.00 net.

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DR. LARUE D. CARTER, Med. Director

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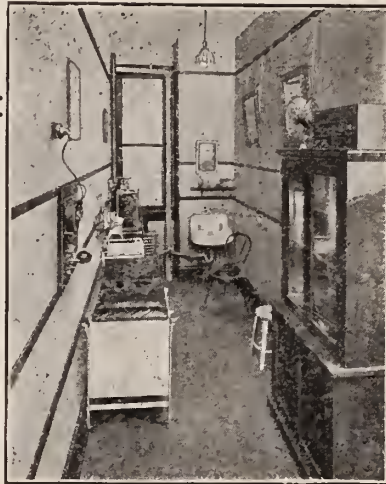
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KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

Published Under the Auspices of the Council

VOL. XXVII.

BOWLING GREEN, KY., OCTOBER, 1929

No. 10

EDITORIAL

THE ANNUAL MEETING

The physicians of Kentucky and their wives are always glad when the time comes around for the Annual Meeting of the Kentucky State Medical Association to be held in Louisville.

Louisville, the metropolis and medical center of the state, is Kentucky's ideal city. It contains about one-third of the wealth of the state, pays about one-third of the taxes which support it and is composed largely of men and women who have come from its counties. It is the seat of the Medical Department of the University of Louisville, which is the survivor and successor of the first medical school west of the Allegheny Mountains and the second in the United States. Between one-third and one-fourth of the physicians in the state are located in Louisville. The Jefferson County Medical Society, which will be the host on this occasion, is one of the most active medical organizations in the whole country.

The scientific program for the session, which has been the creation of the President-Elect, Dr. Granville S. Hanes, who is the *ex-officio* chairman of the committee and his associates, Drs. C. W. Hibbitt, John R. Wathen and W. E. Gardner, with the Secretary acting as *ex-officio* secretary, is the best and most complete program that has ever been presented to the medical profession of Kentucky. The President urges the members to be in their seats in the Roof Garden of the Brown Hotel, where all of the scientific sessions will be held, throughout the three days of Tuesday, Wednesday and Thursday, October 22, 23, 24.

President Hanes asked us to call another matter to the attention of the visiting physicians from out in the state which is of the utmost importance. He has requested that the profession in Louisville hold no clinics during these three days. He wants us to request the profession in the state to arrange so that any patients they desire to bring to Louisville at this time shall come after the meeting so that both the visitors and the profession of Louisville will have the opportunity of attending its sessions. It is not fair to the

Louisville men to ask them to remain in their offices and miss the meetings. The program was arranged months ago and essays are to present complete pictures that no one can afford to miss.

The House of Delegates will meet on Monday afternoon, October 21. As usual, a large attendance of delegates is expected on that day. In this issue, the members and delegates will find the report of the Council and the financial statement in the same complete form that has been published for the past twenty-six years. The Constitution and By-Laws are also reprinted. Delegates are urged to familiarize themselves with these reports and to be prepared for action upon them and upon any other matters they may desire to bring before the profession.

Especially complete arrangements have been made for the sessions of the Woman's Auxiliary by Mrs. J. T. Reddick, of Paducah, President, and Mrs. P. E. Blackerby, of Louisville, the President-Elect. A preliminary and informal conference will be held on Monday evening to meet Mrs. George H. Hoxie, of Kansas City, the President of the Woman's Auxiliary of the American Medical Association, who will deliver the principle address before the Auxiliary on Tuesday. Complete programs have been arranged for both Tuesday and Wednesday. Thursday will be left free for the ladies to visit the shops of Louisville. The preliminary correspondence has assured the largest attendance for the sessions of the Woman's Auxiliary which have yet been held. Those who have attended previous sessions of the Auxiliary and who are familiar with its work in the Southern Medical Association and the American Medical Association, realize its importance. In the report of the Council, this is again emphasized and members are urged to bring their wives to Louisville that they may become familiar with the important developments in this field.

Everything points to the Louisville session being the largest in point of attendance and the best from the viewpoint of scientific interest and medical education that has ever been held. We hope to see every one of you in Louisville for the entire three days of the session.

DISTINGUISHED VISITORS

At the Annual Meeting of the Association this year, Doctor Charles H. Mayo, the distinguished surgeon of Rochester, Minnesota, will deliver the public address on Wednesday evening, October 23, at 8 p. m. To those who heard Dr. Mayo when he delivered the public address at a former session of the Association in Louisville or who have heard him elsewhere, this announcement will be the only thing necessary to secure their attendance. To others it is a pleasure to say that Dr. Mayo is the most delightful public speaker in the medical profession today and we wish every physician and every individual in Kentucky could hear his address.

The Woman's Auxiliary which has contributed so much to medical organization in Kentucky in the past few years, will have as its guest as luncheon speaker, Mrs. Geo. H. Hoxie, of Kansas City, Missouri. Every doctor's wife, who has had the privilege of meeting and hearing Mrs. Hoxie, will return home with a feeling of greater respect for her husband's profession and will find a new field of usefulness in fine public service.

THE GOLF TOURNAMENT

Final arrangements have been completed for the Annual Golf Tournament, which will be played at the Louisville Country Club. Every member attending the Louisville Meeting is eligible for this event, and the members of the Woman's Auxiliary are also invited to participate. The tournament can be played any time beginning Saturday, October 19th, through Wednesday, October 23rd. These dates are selected so that every doctor will have an opportunity to enter the contest and not miss any part of the program. There will be a box at the Caddy House for collecting the score cards.

The committee is composed of Drs. D. Y. Keith, Chairman, R. G. Spurling and J. A. Kirk, and they have requested that every doctor, whether he can play or not, enter the tournament.

Trophies will be given as follows: Blue Grass trophy: Low Gross, no member of Jefferson County will be eligible—silver water pitcher, donated by Brown Hotel.

Pennyrite trophy: Low Gross, every member eligible. Silver trophy donated by Jones Apothecary Shop, Francis Building. Trophies in kicker's handicap—Parker Fountain Pen Desk Set, donated by Newman Drug Co., silver trophy, by President G. S. Hanes; physician's bag, donated by Denhard Instrument Co., physician's bag, by Tafel Instrument Company. If other trophies are donated, the closest number to the lucky draw in kicker's

handicap, will be considered the lucky numbers.

A STUDENT LOAN FUND

The House of Delegates at the Richmond Session authorized the President to appoint a committee to solicit funds for a student loan to be made available to any Kentuckian who desires to study medicine and needs financial aid. This forward movement to assist our own boys and girls is in line with what other organizations are doing. The Western State Normal, The Parent-Teachers Association, Federation of Women's Clubs, and The Council of Jewish Women have scholarship student loan funds and report that there has rarely been a student that did not refund the loan. The committee appointed by the President is composed of:

Dr. G. S. Hanes, Chairman.

Dr. L. H. South, Secretary.

Dr. David Barrow, Lexington.

Dr. Irvin Abell, Louisville.

Dr. J. Walker Moore, Louisville.

Dr. E. S. Moss, Williamsburg.

Dr. R. E. Smith, Henderson.

The funds will be accounted for in the same detailed manner that all the finances of the Association are managed. A list of donors and amounts will be published in the annual number of the JOURNAL. The awards of scholarships will be made by the committee. This money will be loaned to the students and they will be given ample time to repay it. We hope by this means to assist worthy ambitions. We are asking each County Society to raise \$25.00 for this fund, and any private donations will be gladly accepted.

A Study of Behavior in the Newborn.—Louise Taylor-Jones (American Journal of the Medical Sciences) has tried to learn through neuromuscular and other reactions something of the psychology of the day old baby. She comes to the following startling conclusions:

Most of the special senses are used immediately after birth; all may be. The day old baby has many activities. Babies at birth have individuality and personality, as shown by their varied performances. Babies learn the first day of life; so that formation of habits and character begins then. Finally, it may be said that studies of the reactions even at this early age may be of value in estimating the mental capacity of the baby, and that it may be possible to derive sufficient information even from a newborn infant to make a fairly reliable prognosis of the future development.—Med. Journ. and Record.

SCIENTIFIC EDITORIAL

THE ETIOLOGY OF TRACHOMA

The "sore eyes" of this country, which in Europe is commonly referred to as the "Egyptian Eye Disease" because it was supposed that Napoleon's soldiers brought it into Europe on their return from Egypt, has always been an enigma regarding its etiology. Ever since a form of conjunctivitis characterized by the formation of follicles or granules, their breaking down in ulcer formation and a subsequent cicatrization has been recognized and designated trachoma, it has been known to be a communicable disease carried from one individual to another by immediate contact or through the medium of towels, handkerchiefs, etc. and that it is most prevalent in classes of careless habits. However, as yet little progress has been made in determining the specific cause of the disease. Bacteriologists have worked diligently in their endeavor to reveal a micro-organism in the secretion of trachoma or in the lesions of the conjunctiva, but none have stood the test as applied according to the postulates of Koch.

About a year ago the medical profession was aroused over the claim of Noguchi that he had isolated a germ specific for trachoma. However, his conclusions have not been corroborated by others which is especially to be regretted as such discovery would have been a glowing climax to the illustrious career of this eminent and zealous Japanese bacteriologist, who has but recently been a martyr to the cause of the welfare of humanity.

At the last meeting of the American Ophthalmological Society the advisory committee on trachoma among the American Indians of which Dr. Wm. H. Wilder, of Chicago, is chairman, submitted a most interesting report. The work of Ida A. Bengston, Bacteriologist of U. S. Public Health Service, relative to the etiology of this obscure disease was commended. Her studies were especially directed toward the most recent microscopic changes which have been observed in the conjunctival cells in trachomatous cases, more especially the "inclusion bodies" of Prowazer and the "initial bodies" of Lindner. Her studies of the Prowazer bodies include 230 cases of conjunctival affections diagnosed by the staff of the United States Trachoma Hospital at Rolla, Mo., as trachoma together with material excised from the lids in tarsectomies and 15 entropion operations. In 45% of these cases inclusion bodies could be demonstrated. It seems that these formations in the epithelial cells originate from rod shaped bacteria and that a multiplication of these invading organisms takes place in the cytoplasm and a consequent transformation into coccoid

forms designated by Prowazer as "elementary bodies." Lindner has described what he calls "initial bodies" as modified within the cell but some also outside the cells as oval or cylindrical bodies. Bengston interprets the various varieties of inclusion bodies in that the conjunctiva exposed as it is must be unusually rich in protective substance, probably lytic in action, and that this substance destroys or inhibits bacterial growth converting them into unrecognizable forms. She was able in her studies to produce experimentally in animals forms corresponding to the elementary bodies of Prowazer and the initial bodies of Lindner. She concluded that while these bodies were in all probability of bacterial origin this rather proves or disproves that they are concerned in the etiology of trachoma, although their presence in a considerable percentage of trachoma cases would indicate that they are probably of etiological significance. Prof. Lindner, of Vienna, who last year visited this country, examined 18 macacus monkeys and a chimpanzee in Noguchi's laboratory and pronounced that they did not have trachoma but a typical conjunctivitis folliculosis. He based his opinion on the observation that the conjunctiva between the large prominent granules was pale and clear and that inclusion bodies and initial bodies could be demonstrated in all of these 20 cases. Lindner also had the opportunity to examine four of the five cases that Noguchi had used for his experiments and of these he pronounced two as having typical trachoma and two with normal conjunctiva, and hence he suggested the possibility of mixed infection of trachoma and folliculosis having existed in these cases and that Noguchi's inoculations may have been made with the material from such cases.

At any rate the Advisory committee on Trachoma concludes that the problem of the etiology of trachoma has as yet not been solved and urges further investigation along these lines.

ADOLPH O. PFINGST.

Extraperitoneal Cesarean Section with Uteroparietal Suture.—Zarate presents three successive operations, extraperitoneal cesarean section by a new method, second cesarean section and subcutaneous symphysiotomy, in one patient. In the first operation, the author isolated the anterior surface of the uterus from the rest of the abdominal cavity, and afterward used a suture en bloc, in which the two edges of the abdominal incision were fastened to the two edges of the uterine wound. Healing, in this case by second intention, resulted in an excellent uterine cicatrice which withstood the test of two pregnancies and one labor almost to complete dilatation.

OFFICIAL ANNOUNCEMENTS

PRELIMINARY PROGRAM KENTUCKY
STATE MEDICAL ASSOCIATION,
OCTOBER 21-24, 1929
TUESDAY P. M.

SCARLET FEVER SYMPOSIUM

"Etiology and Symptomatology of Scarlet Fever" — Jewett Marshall, M. D., Paducah.

"Diagnosis and Treatment of Scarlet Fever" — C. M. McKinlay, M. D., Lexington.

"Ear Complications in Scarlet Fever" — J. R. Peabody, M. D., Louisville.

"A Practical Demonstration for the Control of Scarlet Fever" — J. L. Jones, M. D., Louisville.

Discussion to be opened by:

J. W. Armstrong, M. D., Berea.

R. Julian Estill, M. D., Lexington.

A. L. Bass, M. D., Louisville.

TUESDAY P. M.

SURGICAL SECTION

Chas. A. Vance, M. D., Lexington, Chairman

"Diverticulitis of the Sigmoid" — Warren P. Sights, M. D., Paducah.

"Surgery in Diabetes" — E. B. Bradley, M. D., Lexington.

"Reducing the Mortality of Acute Intestinal Obstruction" — Frank K. Boland, M. D., Atlanta, Ga.

"The Value of Functional Tests in Surgery" — C. W. Dowden, M. D., Louisville.

"Perforated Duodenal Ulcer: Some Observation on Diagnosis and Treatment." — J. Garland Sherrill, M. D., Louisville.

"Treatment of Duodenal Fistula," with Case Report — J. M. Salmon, M. D. and W. L. Gambill, M. D., Ashland. Presented by Dr. Salmon.

TUESDAY NIGHT

ORATION IN MEDICINE — "The Public's Obligation to the Medical Profession." — E. L. Gowdy, M. D., Campbellsville.

ORATION IN SURGERY — "History of Orthopedic Surgery" — (Illustrated) — W. Barnett Owen, M. D., Louisville.

WEDNESDAY A. M.

"Use of Iodine in Hyperthyroidism" — R. P. Ball, M. D., Louisville.

Discussion to be opened by:

Virgil E. Simpson, M. D., Louisville.

"End Results of Five Years Work in Department of Gynecology." — University of Louisville at the City Hospital. — Gynecological Staff of the University of Louisville.

"The Injection Treatment of Varicose Veins" — Frank P. Strickler, M. D., Louisville.

"Sacral Anesthesia" — Cecil D. Gaston, M. D., Birmingham, Alabama.

"Spinal Anesthesia" — E. W. Northcutt, M. D., Covington.

Discussion to be opened by:

David C. Elliott, M. D., Louisville.

"The Passing of the Country Doctor" — J. H. Hendren, M. D., Straight Creek.

"Importance of Diagnosis in Renal Infection" — E. Owsley Grant, M. D., Louisville.

Discussion to be opened by:

W. T. Briggs, M. D., Lexington.

"The Use of Skin Grafts in Plastic Surgery" — F. M., Massie, M. D., Lexington.

Discussion to be opened by:

F. L. Koontz, M. D., Louisville.

WEDNESDAY P. M.

SYMPOSIUM ON DIABETES

"Diabetes Mellitus" — Fredrick G. Speidel, M. D., Louisville.

"Ocular Manifestations" — A. O. Pfiugst, M. D., Louisville.

"Surgical Aspect in Diabetes" — C. C. Howard, M. D., Glasgow.

Discussion to be opened by:

Virgil E. Simpson, M. D., Louisville.

R. Hayes Davis, M. D., Louisville.

J. W. Stephenson, M. D., Ashland.

"Undulant Fever" — L. H. South, M. D., Louisville.

WEDNESDAY NIGHT

Public Addresses:

The speakers will be Charles H. Mayo, M. D., Rochester, Minnesota and Morris Fishbein, M. D., Chicago, Illinois.

THURSDAY A. M.

SYMPOSIUM ON INFLUENZA

"Medical: Clinical Course in Treatment of Influenza" — W. J. Shelton, M. D., Mayfield.

"X-Ray Diagnosis of Complications of Influenza" — C. D. Enfield, M. D., Louisville.

"Surgical Treatment of Empyema" — E. S. Allen, M. D., Louisville.

"Ear Complications" — J. W. Nolan, M. D., Harlan.

"Psychosis following Influenza" — H. B. Scott, M. D., Louisville.

Discussion to be opened by:

W. A. Jenkins, M. D., Louisville.

Austin Bell, M. D., Hopkinsville.

W. V. Neel, M. D., Henderson.

W. A. Weldon, M. D., Glasgow.

"Broncho-Pneumonia in Children" — Clay Crawford, M. D., Fort Thomas.

THURSDAY P. M.

"Relief of Pain During Labor" — L. C. Redmon, M. D., Lexington.

"Intra-Cranial Hemorrhage of the New Born" — Phillip F. Barbour, M. D., Louisville.

"Version and Extraction" — C. C. English, M. D., Louisville.

Discussion to be opened by:

Sam P. Oldham, M. D., Owensboro.

Edward Speidel, M. D., Louisville.

Alice Pickett, M. D., Louisville.

OFFICIAL CALL

THE SEVENTY-NINTH ANNUAL MEETING OF
THE KENTUCKY STATE MEDICAL ASSOCIATION
TO BE HELD AT THE BROWN

HOTEL ROOF GARDEN, LOUISVILLE.

To the Officers and Members of the Component County Societies of the Kentucky State Medical Association:

The Seventy-Ninth Annual Meeting of the Kentucky State Medical Association will convene in the Roof Garden, Brown Hotel, Louisville, on Monday, Tuesday, Wednesday and Thursday, October 21, 22, 23, 24, 1929.

THE HOUSE OF DELEGATES

The House of Delegates of the Kentucky State Medical Association will convene in the Roof Garden, Brown Hotel, Louisville, at 2 p. m., on Monday, October 21, 1929.

FIRST GENERAL SESSION

The First General Session which constitutes the opening exercises of the scientific functions of the Association, will be held in Roof Garden, Brown Hotel, Tuesday, October 22, 1929, at 9 a. m.

THE COUNCIL

The Council will convene at the Roof Garden, Brown Hotel, Monday, October 21, 1929, at 10:30.

THE REGISTRATION DEPARTMENT

The Registration Department will be open in Roof Garden, Brown Hotel, from 10 a. m. to 5 p. m., on Monday, October 21; from 8 a. m. to 5 p. m., on Tuesday and Wednesday, October 22 and 23; and from 8 a. m. to 12 m., on Thursday, October 24, 1929.

COUNCILOR DISTRICTS

FIRST DISTRICT

V. A. Stille, Benton, Councilor.

Ballard	Livingston	Crittenden
Caldwell	McCracken	Fulton
Calloway	Marshall	Graves
Carlisle	Trigg	Hickman
		Lyon

SECOND DISTRICT

D. M. Griffith, Owensboro, Councilor.

Davies	Hopkins	Ohio
Hancock	McLean	Union
Henderson	Muhlenberg	Webster

THIRD DISTRICT

C. C. Howard, Glasgow, Councilor.

Allen	Cumberland	Simpson
Barren	Logan	Todd
Butler	Monroe	Warren-Edmonson
Christian	Metcalfe	

FOURTH DISTRICT

D. E. McClure, Elizabethtown, Councilor.

Breckinridge	Hardin	Meade
Bullitt	Hart	Nelson
Grayson	Larue	Spencer

FIFTH DISTRICT

W. E. Gardner, Louisville, Councilor.

Carroll	Gallatin	Shelby
Oldham	Henry	Trimble
Franklin	Jefferson	Owen

SIXTH DISTRICT

R. C. McChord, Lebanon, Councilor.

Adair	Green	Taylor
Anderson	Marion	Washington
Boyle	Mercer	

SEVENTH DISTRICT

V. G. Kinnaird, Lancaster, Councilor.

Casey	Lincoln	Rockcastle
Clinton	McCronry	Russell
Garrard	Pulaski	Wayne

EIGHTH DISTRICT

C. W. Shaw, Alexandria, Councilor.

Boone	Fleming	Mason
Bracken	Grant	Nichols
Campbell-Kenton	Farrison	Fendleton
		Robertson

NINTH DISTRICT

S. C. Smith, Ashland, Councilor.

Boyd	Greenup	Martin
Carter	Johnson	Magoffin
Elliott	Lewis	Pike
Floyd	Lawrence	

TENTH DISTRICT

C. A. Vauce, Lexington, Councilor.

Brth	Lee	Rowan
Bourbon	Madison	Scott
Breathitt	Menifee	Wolfe
Clark	Montgomery	Estill
Fayette	Powell	Woodford
Jessamine	Morgan	

ELEVENTH DISTRICT

W. M. Martin, Harlan, Councilor.

Bell	Knott	Leslie
Blay	Knox	Owsley
Harlan	Laurel	Perry
Jackson	Letcher	Whitely

CONSTITUTION AND BY-LAWS OF THE KENTUCKY STATE MEDICAL ASSOCIATION ADOPTED AT PADUCAH IN 1902 AS AMENDED

CONSTITUTION

ARTICLE I.—NAME OF THE ASSOCIATION.

The name and title of this organization shall be the Kentucky State Medical Association.

ARTICLE II.—PURPOSE OF THE ASSOCIATION

The purpose of the Association shall be to federate and bring into compact organization the entire medical profession of the State of Kentucky, and to unite with similar associations in other states to form the American Medical Association, with a view to the extension of medical knowledge, and to the advancement of medical science, to the elevation of the standard of medical education, and to the enactment and enforcement of just medical laws; to the promotion of friendly intercourse among physicians, and to the guarding and fostering of their material interest and to the enlightenment and direction of public opinion in regard to the great problems of state medicine, so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life.

ARTICLE III.—COMPONENT SOCIETIES

Component Societies shall consist of those county medical societies which hold charters from this Association.

ARTICLE IV.—COMPOSITION OF THE ASSOCIATION

Section 1. This Association shall consist of Members, Delegates and Guests.

Sec. 2.—MEMBERS. The members of this Association shall be the members of the component county medical societies.

Sec. 3.—DELEGATES. Delegates shall be those members who are elected in accordance with this Constitution and By-Laws to rep-

resent their respective component county societies in the House of Delegates of this Association.

Sec. 4.—GUESTS. Any distinguished physician not a resident of this State may become a guest during any Annual Session upon invitation of the Association or its Council, and shall be accorded the privileges of participating in all of the scientific work of that session.

ARTICLE V.—HOUSE OF DELEGATES

The House of Delegates shall be the legislative and business body of the Association, and shall consist of (1) Delegate elected by the component county societies, and (2) *ex-officio*, the officers of the Association as defined in Article VIII, Section 1, of this Constitution.

ARTICLE VI.—SECTIONS AND DISTRICT SOCIETIES

The House of Delegates may provide for a division of the scientific work of the Association into appropriate Sections, and for the organization of such Councilor District Societies as will promote the best interest of the profession, such societies to be composed exclusively of members of component county societies.

ARTICLE VII.—SESSIONS AND MEETINGS

Section 1. The Association shall hold an Annual Session, during which there shall be held daily not less than two General Meetings, which shall be open to all registered members, delegates and guests.

Sec. 2. The time and place for holding each Annual Session shall be fixed by the House of Delegates.

ARTICLE VIII.—OFFICERS

Section 1. The officers of this Association shall be a President, three Vice-Presidents, a Secretary, a Treasurer, and eleven Councilors.

Sec. 2. The President and Vice-Presidents shall be elected for a term of one year. The Secretary, Treasurer and Councilors shall be elected for terms of five years each, the Councilors being divided into classes so that two shall be elected each year. All of these officers shall serve until their successors are elected and installed.

Sec. 3. The Officers of the Association shall be elected by the House of Delegates on the morning of the last day of the Annual Session, but no Delegate shall be eligible to any office named in the preceding section, except that of Councilor, and no person shall be elected to any such office who is not in attendance upon the Annual Session, and who has not been a member of the Association for the past two years.

ARTICLE IX.—FUNDS AND EXPENSES

Funds for meeting the expenses of the Association shall be arranged for by the House

of Delegates by an equal per capita assessment upon each county society to be fixed by the House of Delegates, by voluntary contribution, and from the profits of its publication. Funds may be appropriated by the House of Delegates to defray the expenses of the Annual Session, for publication and for such other purposes as will promote the welfare of the Association and profession.

ARTICLE X.—REFERENDUM

The General Meeting of the Association may, by a two-thirds vote, order a general referendum upon any question pending before the House of Delegates, and the House of Delegates may, by a similar vote of its own members, or after a like vote of the General Meeting, submit any such question to the membership of the Association for a final vote; and if the persons voting shall comprise a majority of all the members, a majority of such vote shall determine the question and be binding upon the House of Delegates.

ARTICLE XI.—THE SEAL

The Association shall have a common Seal with power to break, change or renew the same at pleasure.

ARTICLE XII.—AMENDMENTS

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at that Annual Session, provided that such amendment shall have been presented in open meeting at the previous Annual Session, and that it shall have been sent officially to each component county society at least two months before the session at which final action is to be taken.

BY-LAWS

CHAPTER I.—MEMBERSHIP

Section 1. All members of the Component County Societies shall be privileged to attend all meetings and take part in all the proceedings of the Annual Session, and shall be eligible to any office within the gift of the Association. PROVIDED, that no physician may become a member of any county society unless he signs and keeps inviolate the following pledge:

I hereby promise upon my honor as a gentleman that I will not so long as I am a member of the Kentucky State Medical Association practice division of fees in any form; neither by collecting fees from others referring patients to me nor by permitting them to collect my fees for me; nor will I make joint fees with physicians or surgeons referring patients to me for operation or consultation; neither will I in any way, directly or indirectly, compensate anyone referring patients to me nor will I utilize any man as an assistant as a subterfuge for this purpose.

Sec. 2. The name of a physician upon the properly certified roster of members, or list

of delegates, of a chartered county society which has paid its annual assessment, shall be *prima facie* evidence of his right to register at the Annual Session in the respective bodies of this Association.

Sec. 3. No persons who are under sentence or suspension or expulsion from any component society of this Association, or whose name has been dropped from its roll of membership shall be entitled to any of the rights or benefits of this Association, nor shall he be permitted to take part in any of its proceedings, until such time as he has been relieved of such liability.

Sec. 4. Each member in attendance at the Annual Session shall enter his name on the registration book, indicating the component society of which he is a member. When his right to membership has been verified by receiving a badge which shall be evidence of his reference to the roster of the society, he shall have right to all privileges of membership at that session. No member or delegate shall take part in any of the proceedings of an annual session until he has complied with the provisions of this section.

CHAPTER II.—ANNUAL AND SPECIAL SESSION OF THE ASSOCIATION

Section 1. The Association shall hold an annual session, meeting every third year in the city of Louisville, and the other two years at some point in the State fixed at the preceding annual session.

CHAPTER III.—GENERAL MEETING

Section 1. The General Meeting shall include all registered members, delegates and guests, who shall have equal rights to participate in the proceedings and discussions; and except guests, to vote on pending questions. Each General Meeting shall be presided over by the President or in his absence or disability or upon his request, by one of the Vice-Presidents. Before it, at such time and place as may have been arranged, shall be delivered the annual address of the President, and the annual orations and the entire time of the sessions as far as may be, shall be devoted to papers and discussions relating to scientific medicine.

Sec. 2. The General Meeting shall have authority to create committees or commission for scientific investigations of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be approved by the House of Delegates.

Sec. 3. Except by special vote, the order of exercises, papers and discussions as set forth in the official program shall be followed from day to day until it has been completed.

Sec. 4. No address or paper before the Association, except those of the President and

orators shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor more than once on any subject.

Sec. 5. All papers read before the Association shall be its property. Each paper shall be deposited with the Secretary when read and if this is not done it shall not be published.

CHAPTER IV.—HOUSE OF DELEGATES.

Section 1. The House of Delegates shall meet annually at the time and place of the Annual Session of the Association and shall so fix its hours of meeting as not to conflict with the first General Meeting of the Association, or with the meeting held for the address of the President and the annual orations and so as to give delegates an opportunity to attend the other scientific proceedings and discussions so far as is consistent with their duties. But if the business interests of the Association and profession required it may meet in advance or remain in session after the final adjournment of the General Meeting.

Sec. 2. Each component county society shall be entitled to send to the House of Delegates each year one delegate for every twenty-five members, and one for each major fraction thereof, but each county society holding a charter from this Association, which has made its annual report and paid its assessments as provided in this Constitution and By-Laws shall be entitled to one delegate. In case the regularly elected delegate or alternate is unable to attend the annual meeting of the Association, the President of the county society may in writing appoint an alternate, who shall have the rights and privileges of a delegate.

Sec. 3. A majority of the registered delegates shall constitute a quorum and all of the meetings of the House of Delegates shall be open to members of the Association.

Sec. 4. It shall, through its officers, Advisory Council, and otherwise, give diligent attention to and foster the scientific work and spirit of the Association, and shall constantly study and strive to make each Annual Session a stepping stone to further ones of higher interest.

Sec. 5. It shall consider and advise as to the material interest of the profession, and of the public in those important matters wherein it is dependent upon the profession, and shall use its influence to secure and enforce all proper medical and public-health legislation, and to diffuse popular information in relation thereto.

Sec. 6. It shall make careful inquiry into the condition of the profession of each county in the State, and shall have authority to adopt such methods as may be deemed most

efficient for building up and increasing the interest in such county societies as already exist and for organizing the profession in counties where societies do not exist. It shall especially and systematically endeavor to promote friendly intercourse between physicians of the same locality and shall continue these efforts until every physician in every county of the State who can be made reputable, has been brought under medical society influence.

Sec. 7. It shall encourage post-graduate work in medical centers as well as home study and research and shall endeavor to have the results of the same utilized and intelligently discussed in the county societies. With these ends in view, five years after the adoption of the By-Laws no voluntary paper shall be placed upon the annual program or be heard in the Association which has not first been heard in the county society of which the author is a member.

Sec. 8. It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body in such manner that not more than one-half of the delegates shall be elected in any one year.

Sec. 9. It shall upon application provide and issue charters to county societies organized to conform to the spirit of the Constitution and By-Laws.

Sec. 10. In sparsely settled sections it shall have authority to organize the physicians of two or more counties to be designated by hyphenating the names of two or more counties so as to distinguish them from district and other classes of societies and these societies, when organized and chartered shall be entitled to all the privileges and representation provided herein for county societies, until such counties may be organized separately.

Sec. 11. It may divide the counties of the State into Councilor Districts, and, when the best interests of the Association and profession will be promoted thereby, organize in each district a medical society, to meet midway between the annual session of the Association and members of the chartered county societies and none other shall be members.

When so organized from the presidents of such districts societies shall be chosen the Vice-Presidents of this Association and the Presidents of the county societies of the district shall be the Vice-Presidents of such district societies.

Sec. 12. It shall have authority to appoint committees for special purposes from among members of the Association who are not members of the House of Delegates, and such committee may report to the House of Delegates in person, and may participate in the debate thereon.

Sec. 13. It shall approve all memorials and resolutions issued in the name of the

Association before the same shall become effective.

Sec. 14. It shall present a summary of its proceedings to the last General Meeting of each Annual Session, and shall publish the same in the Journal.

CHAPTER V.—ELECTIONS OF OFFICERS

Section 1. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect, provided, however, that when there are more than two nominees the nominee receiving the least number of votes on the first ballot shall be dropped and the balloting continue until an election occurs in like manner.

Sec. 2. Any member known to have directly or indirectly solicited votes for or sought any office within the gift of this Association shall be ineligible for any office for two years.

Sec. 3. The election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the morning of the last day of the General Session.

Sec. 4. Nominations for President shall be called for by counties.

CHAPTER VI.—DUTIES OF OFFICERS

Section 1. The President shall preside at all meetings of the Association and of the House of Delegates; shall appoint all committees not otherwise provided for; shall deliver annual address at such time as may be arranged; shall give a deciding vote in case of a tie, and shall perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession of the State during his term of office, and so far as practicable, shall visit by appointment, the various sections of the State and assist the Councilors in building up the county societies and in making their work more practical and useful.

Sec. 2. The Vice-President shall assist the President in the discharge of his duties. In the event of his death, resignation or removal the Council shall elect one of the Vice-Presidents to succeed him.

Sec. 3. The Treasurer shall give bond for the trust imposed in him whenever the House of Delegates shall deem it requisite. He shall demand and receive all funds due the Association, together with the bequests and donations. He shall, under the direction of the House of Delegates, sell or lease any real estate belonging to the Association and execute the necessary papers, and shall in general subject to such direction, have the care and management of the fiscal affairs of the Association. He shall pay money out of the Treasury only on written order of the President, countersigned by the Secretary; he shall subject his accounts to such examinations as the House of Delegates may order, and he shall annually render an account of his doings

and of the state of funds in his hands.

The council shall be the executive body of the House of Delegates and between sessions shall exercise the powers conferred on the House of Delegates by the constitution and by-laws.

Sec. 4. The Secretary, acting with the Committee on Scientific Work, shall prepare and issue the program for and attend all meetings of the Association and of the House of Delegates and he shall keep minutes of their respective proceedings in separate record books. He shall charge upon his books the assessments against each component county society at the end of the fiscal year; he shall collect and make proper credits for the same, and perform such other duties as may be assigned to him. He shall be custodian of all record books and papers belonging to the Treasurer, and shall keep account of and promptly turn over to the Treasurer all funds of the Association which come into his hands. He shall provide for the registration of the members and delegates at the Annual Sessions. He shall keep a card index register of all the legal practitioners of the State by counties, noting on each his status in relation to his county society and upon request shall transmit a copy of this list to the American Medical Association for publication. In so far as it is in his power he shall use the printed matter, correspondence and influence of his office to aid the Councilors in the organization and improvement of the county societies and in the extension of the power and usefulness of this Association. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall act as secretary of the Committee on Scientific Work. He shall be editor of the KENTUCKY MEDICAL JOURNAL. He shall employ such assistants as may be ordered by the Council or the House of Delegates. He shall annually make a report of his doings to the House of Delegates.

In order that the secretary may be enabled to give that amount of time to his duties which will permit of his becoming proficient it is desirable that he shall receive some compensation. The amount of his salary shall be fixed by the House of Delegates.

CHAPTER VII.—COUNCIL

Section 1. The Council shall hold daily meetings during the annual session of the Association and at such other times as necessity may require, subject to the call of the Chairman or on petition of three Councilors. It shall meet on the last day of the Annual Session of the Association for re-organization and for the outlining of the work for the ensuing year. At this meeting it shall elect a chairman and secretary and it shall keep a permanent record of its proceedings. It shall

through its Chairman, make an annual report to the House of Delegates at such time as may be provided, which report shall include an audit of the account of the Secretary and Treasurer and other agents of this Association, and shall also specify the character and cost of all the publications of the Association during the year, and the amounts of all other property belonging to the Association, or under its control, with such suggestions as it may deem necessary. In the event of a vacancy in any office the Council may fill the same until the annual election.

Sec. 2. Each Councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession and for improving and increasing the zeal of the county societies and their members. He shall make an annual report of his doings, and of the condition of the profession of each county in his district to each Annual Session of the House of Delegates. The necessary traveling expenses incurred by Councilor in the line of his duties herein imposed may be allowed by the House of Delegates upon a proper itemized statement, but this shall not be construed to include his expenses in attending the Annual Session of the Association.

Sec. 3. Collectively the Council shall be the Board of Censors of the Association. It shall consider all questions involving the right and standing of members, whether in relation to other members, to the component societies, or to this Association. All questions of an ethical nature brought before the House of Delegates of the General Meeting shall be referred to the Council without discussion. It shall hear and decide all questions of discipline effecting the conduct of members or of a county society upon which appeal is taken from the decision of an individual Councilor. Its decision in all such cases shall be final.

Sec. 4. The Council shall have the right to communicate the views of the profession and of the Association in regard to health, sanitation and other important matters to the public and the lay press. Such communications shall be officially signed by the chairman and secretary of the Council, as such.

Sec. 5. The Council shall provide for and superintend the publication and distribution of all proceedings, transactions and memoirs of the Association and shall have authority to appoint such assistants to the editors as it deems necessary. It shall manage and conduct the KENTUCKY MEDICAL JOURNAL, which is the organ of the Association, and all money received by the JOURNAL, the Council or any officer of the Association, shall be paid to the Treasurer of the Association on the first of each month.

Sec. 6. All reports on scientific subjects and all scientific discussions and papers heard before the Association shall be referred to the KENTUCKY MEDICAL JOURNAL for publication. The editor, with the consent of the Councilor for the District in which he resides may curtail or abstract papers or discussions, and the Council may return any paper to its author which it may not consider suitable for publication.

Sec. 7. All commercial exhibits during the annual session shall be within the control and direction of the Council.

CHAPTER VIII.—COMMITTEES.

Section 1. The standing committees shall be as follows:

A Committee on Scientific Work.

A Committee on Public Policy and Legislation.

A Committee on Medical Education.

A Medico-Legal Committee.

A Committee on Arrangements, and such other committees as may be necessary. Such committees shall be elected by the House of Delegates, unless otherwise provided.

Sec. 2. The Committee on Scientific Work shall consist of three members of which the President-elect shall be a member and Chairman, and the Secretary shall be a member and Secretary, and shall determine the character and scope of the scientific proceedings of the Association, subject to the provisions or the instructions of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the Association as nearly as practicable.

Sec. 3. The Committee on Public Policy and Legislation shall consist of three members and the President and Secretary. Under the direction of the House of Delegates it shall represent the Association in securing and enforcing legislation in the interest of the public health and scientific medicine. It shall keep in touch with the profession and public opinion, shall endeavor to shape legislation so as to secure the best results for the whole people, and shall utilize every organized influence in local, state and national affairs and elections. Its work shall be done with dignity becoming a great profession and with that wisdom which will make effective its work and influence. It shall have authority to be heard before the entire Association upon questions of great concern at such times as may be arranged during the annual session.

Sec. 4. The Committee on Arrangements shall consist of the component society in the territory in which the annual session is to be held. It shall by committees of its own selection, provide suitable accommodations for

the meeting-places of the Association and of the House of Delegates, and of their respective committees, and shall have general charge of all arrangements. Its Chairman shall report an outline of the arrangements to the Secretary for publication in the program, and shall make additional announcements during the session as occasion may require.

Sec. 5. The Medico-Legal Committee shall consist of three members, one of whom, the Chairman, shall be elected by the Council for five years, and the Secretary and Treasurer shall be the other two members *ex officio*. This committee shall select and fix the compensation for an attorney, who shall act as General Counsel, and if required, additional local counsel. The Association through this Committee shall defend its members who are in good standing against unjust suits for malpractice.

CHAPTER IX.—ASSESSMENTS AND EXPENDITURES

Section 1. The assessment of five dollars per capita on the membership of the component societies is hereby made the annual dues of this Association. The Secretary of each county society shall forward its assessment together with its roster of all officers and members, lists of delegates, and list of non-official physicians of the county to the Secretary of this Association on the first day of January in each year.

Sec. 2. Any county society which fails to pay its assessments, or make the report required, on or before the first day of April in each year, shall be held as suspended, and none of its members, or delegates shall be permitted to participate in any of the business or proceedings of the Association or of the House of Delegates until such requirements have been met.

Sec. 3. All motions or resolutions appropriating money, shall specify a definite amount, or so much thereof as may be necessary for the purpose indicated, and must be approved by the Council and House of Delegates.

CHAPTER X.—RULES OF CONDUCT

The principles set forth in the Principles of Ethics of the American Medical Association shall govern the conduct of members in their relation to each other and to the public.

CHAPTER XI.—RULES OF ORDER

The deliberations of this Association shall be governed by parliamentary usage as contained in Roberts Rules of Order, unless otherwise determined by a vote of its respective bodies.

CHAPTER XII.—COUNTY SOCIETIES

Section 1. All county societies now in affiliation with the State Association or those that may hereafter be organized in this State, which have adopted principles or organization not in conflict with this Constitution and

By-Laws, shall upon application to the House or Delegates, receive a charter from and become a component part of this Association.

Sec. 2. As rapidly as can be done after the adoption of this Constitution and By-laws, a medical society shall be organized in every county in the State in which no component society exists, and charters shall be issued thereto.

Sec. 3. Charters shall be issued only upon approval of the House of Delegates and shall be signed by the President and Secretary of this Association. The House of Delegates shall have authority to revoke the charter of any component county society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

Sec. 4. Only one component medical society shall be chartered in any county. Where more than one county society exists, friendly overtures and concessions shall be made with the aid of the Councilor of the District if necessary, and all of the members brought into one organization. In case of failure to unite, an appeal may be made to the Council, which shall decide what action shall be taken.

Sec. 5. Each county society shall judge of the qualifications of its own members, but as such societies are the only portals to this Association, every reputable and legally registered physician who is practicing, or who will agree to practice non-sectarian medicine shall be entitled to membership. Before a charter is issued to any county society, full and ample notice and opportunity shall be given to every physician in the county to become a member.

Sec. 6. Any physician who may feel aggrieved by the action of the society of the county in refusing him membership, or in suspending or expelling him, shall have the right to appeal to the Council, which, upon a majority vote may permit him to become a member of an adjacent county society.

Sec. 7. In hearing appeals the Council may admit oral or written evidence as in its judgment will best and most fairly present the facts, but in case of every appeal, both as a board and as individual councilors in district and county work, efforts at conciliation and compromise shall precede all such hearings.

Sec. 8. When a member in good standing in a component society moves to another county in the State, his name, upon request shall be transferred without cost to the roster of the county society into whose jurisdiction he moves.

Sec. 9. A physician living in or near a county line may hold membership in that county most convenient for him to attend, on permission of the society in whose jurisdiction he resides.

Sec. 10. Each county society shall have general direction of the affairs of the profession in the county, and its influence shall be constantly exerted for bettering the scientific, moral and material conditions of every physician in the county; and systematic efforts shall be made by each member, and by the society as a whole, to increase the membership until it embraces every qualified physician in the county.

Sec. 11. Frequent meetings shall be encouraged, and the most attractive programs arranged that are possible. The younger members shall be especially encouraged to do post-graduate and original research work, and to give the society the first benefit of such labors. Official position and other preferences shall be unstintingly given to such members.

Sec. 12. At the time of the annual election of officers each county society shall elect a delegate or delegates to represent it in the House of Delegates of this Association in the proportion of one delegate to each twenty-five members or major fraction thereof, and the secretary of the society shall send a list of such delegates to the Secretary of this Association at least sixty days before the Annual Session.

Sec. 13. The Secretary of each county society shall keep a roster of its members, and a list of the non-affiliated registered physicians of the county, in which shall be shown the full name, address, college and date of graduation, date of license to practice in this State, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied him for the purpose, to the Secretary of this Association, on the first day of January of each year, or as soon thereafter as possible, and at the same time that the dues accruing from the annual assessment are sent in. In keeping such roster the Secretary shall note any changes in the personnel of the profession by death, or by removal to or from the county, and in making his annual report he shall be certain to account for every physician who has lived in the county during the year.

Sec. 14. The Secretary of each county society shall report to the Kentucky Medical Journal full minutes of each meeting and forward to it all scientific papers and discussions which the society shall consider worthy of publication.

CHAPTER XIII.—AMENDMENTS

These By-Laws may be amended by any Annual Session by a two-thirds vote of all the delegates present at that session, after the amendment has been laid on the table for one day.

REPORT OF THE COUNCIL

To the House of Delegates:

The responsibility for the public health and for the advancement of scientific medicine has been for fifty-one years, wisely, we think, placed by the people of Kentucky, through the General Assembly, on the several schools of medicine and the pharmaceutical profession of Kentucky. In recent years we have had, also, the fine co-operation of the Kentucky State Dental Association. That these splendidly organized groups have done their work well has been indicated by the repeated defeats of destructive legislation, which would have made these activities the tools of partisan politicians. While it is an outrage that the profession, that has so well conducted its public relations, should be subject to these continuous attacks when the whole time of its limited, efficient personnel is so tremendously needed in work for which the State has always made inadequate appropriation, as compared with other progressive states, we can, at least, feel a certain sense of gratitude to their instigators for the natural reaction that has resulted in the consolidation of public opinion, which has not been attained in any other state and which has made possible much of our progress in public health.

Occasionally the query is made, "Since these attacks on the plan of medical organization in Kentucky have been repeated almost biennially since 1918, is there not sufficient wrong to require a remedy?" This is an intelligent question and requires an answer. It is important to remember that these attacks have been instigated by two men, both of whom formerly held responsible positions with the medical organization, and that they have been able in all of these years to secure the support of no responsible, representative members of the medical profession and have, therefore, found it necessary to get their strength from selfish and designing politicians, who think it would be advantageous to secure the patronage controlled by the State Board of Health, and more recently by an unholy alliance with the chiropractors, who are to be benefitted for their assistance by being admitted to the broad field of practice of medicine and surgery through its back door, although totally unqualified and untrained in these fields.

The State Board of Health was created in 1878 as the legal arm of organized scientific medicine to prevent the spread of pestilence and to reduce preventable illness and premature death. The Kentucky State Medical Association had been chartered and organized in 1851 and its records show that it was largely concerned with the study of yellow fever,

cholera, typhus fever and smallpox,—all exotic pestilences which frequently had swept the state, causing the loss of many lives and paralyzing business and social life. It is important to recall that there has not been an epidemic of exotic pestilence in the state since the State Board of Health was created with the exception of smallpox. This is the most easily prevented of all diseases but it requires an effective local organization to secure the benefits of vaccination for all children of school age and it has only been in recent years and in a portion of the state that it has been possible to finance and develop this type of local health work.

It is well also to remember that at the time of the creation of the State Board of Health there were approximately five thousand practitioners of medicine in Kentucky. Roads were so bad in the country and streets so ill-kept in the city that these men spent two-thirds or more of their time between patients and the vast majority of them were able to support themselves only by farming or mercantile pursuits in conjunction with their practice. More than one thousand of them either had not attended any medical school at all or for only a few weeks or months and it soon became evident that the profession must rid itself of this wholly undesirable element before it would be worthy of public confidence. In response to this demand, the General Assembly in 1888 passed the first effective medical practice act, although an abortive act had been previously passed in 1863 attempting to reform medical education. The present generation of physicians in Kentucky have to look in other states to learn anything of the conditions that were faced at this time by those responsible for medical advancement. There were more itinerant advertising quacks making daily or weekly stands in the county seat towns and in Louisville than there have been cultists at any time since. Between 1888 and 1893 more than twelve hundred so-called doctors either stopped practicing entirely or left Kentucky for Indiana and Texas, which were the only two states at that time open to uneducated practitioners.

It must also be recalled that in addition to the frequent ravages of cholera and yellow fever, the death rate from endemic disease was appalling. When the first sanitary survey of Louisville was made in 1884, it was found that the death rate from typhoid fever was greater here than in any other city of the civilized world. The same thing was true in greater or less degree of practically every county seat in the state. In fact, in 1878, the death rate from typhoid fever alone was higher than the present death rate from all diseases. Ignorance, and insanitary conditions that resulted from it, were at the bot-

tom of all this, but that the large number of wholly untrained medical men and their allies, the advertising quacks, were a large contributing factor, was shown by the immediate reduction in the death rate following the passage of the medical practice act.

Realizing the importance of vital statistics, the General Assembly, in 1851, created such a bureau but, even though the first director was the distinguished Dr. Wm. L. Sutton, who was the first president of the Kentucky State Medical Association, it was impossible for him to overcome the political organizations in the isolated counties of that time in such a way as to adequately secure the important items which were essential to a complete study of the incidence of disease. It was only when the present model law was passed in 1910 that Kentucky really began to keep accurate records of births and deaths. The story revealed by these records since that comparatively recent time is one in which every citizen of the state can take pride. Cancer and heart disease are the only causes of death that have increased. Educational campaigns against both of these diseases are developing and we have no doubt that they will, within a few years, be producing as effective results as we have already secured in our battle with tuberculosis. The people of the state should be frequently reminded that it would be impossible today for us to be developing our wonderful system of public highways had we continued to have the high death rate from tuberculosis that we found in 1910. We were then wasting more on this unnecessary but dangerous disease than we are now spending in an orderly fashion through our Highway Department. The educators of the state realize that the still inadequate funds appropriated for our public school system would be impossible had not the ravages of typhoid fever been reduced two-thirds, for typhoid fever is not only a death dealing but an expensive disease.

From the public health standpoint, the most noteworthy development of recent years has been the full time county health departments. It is of interest that Alabama and North Carolina are the only other states which have made the same progress as Kentucky in this development, although Mississippi, Tennessee, and Georgia are also moving rapidly in this direction. These are the states in which the medical profession has most control in working out the health protection of the people. There could be no possible excuse for changing health officers, public health nurses or sanitary inspectors from term to term because of party politics. The things we have accomplished in public health would have been impossible had the tenure of office of the scientific experts of the State Board of Health

been limited to the term of a Governor. Salaries are so low in Kentucky that we must continue to be a training ground for the wealthier states and it would be impossible to secure *trained* personnel for our services at all were it not that they are assured of continuity in office so long as they work effectively.

We again bring to the attention of the House of Delegates the importance of developing a definite program for increasing the supply of properly trained physicians for the small towns and rural sections of the state. While the statements heretofore submitted to you constitute a perfect defense, at the present time, because of the lowered incidence of infectious diseases and constantly decreasing death rate, the very public health education, which we are all conducting, is bound to result in an increased demand for scientific medical service. When physicians become human engineers, as they are sure to do, they will engage not only in repairing defects and treating diseases but will be even more largely engaged in advising the health habits of their patients with a view to the prevention of much of the disease that is now popularly considered inevitable. The pre-natal, infant and pre-school conferences, the annual examination of school children and proper supervision of adolescence in the secondary and higher institutions of learning, is sure to develop a demand not only for an annual physical examination for adults but for a character of dietary and other health habits that will necessitate a considerably larger group of physicians than are now graduating. We must develop a plan before this need overwhelms us. We must have more local hospitals, which are not merely medical and surgical boarding houses for those who are ill, but which are really health centers from which health education and health habits will spread. Experience in other states has indicated that this can only be done in the sections that need them most by a just system of state aid. It is quite as important that the state contribute to the health of its citizens as to the development of their minds in the public school system, their roads in the system of communication or their wealth in the development of better agricultural methods or a more safely controlled banking system. Louisville has always been fortunate in being the center of medical culture and leadership. In the Medical Department of its metropolitan university, it has developed an institution which ranks among the best. Some plan must be devised by which the state can increase the facilities of this institution by providing it with scholarships on such a scale as to enable it to considerably increase the number of its students from the counties of the state; or, if this plan continues to be found unconstitu-

tional, as we have heretofore been advised it was, it may be necessary to develop in our educational systems, just as we have developed the Normal Schools and the State University, a Kentucky School of Medicine. There are many, and serious objections to such a plan. In the beginning, it should probably be so arranged that it would give the first two years only. The greatest difficulty with present day medical education is entrance to the freshman year. Were it provided that a scholar from each of the rural counties of the state might be given the first two years of fundamental training along with his pre-medical college work at some one or more of our State Normal Schools, there would be little difficulty, providing the standard and fundamentals of pre-medical education were carefully kept high, in securing admission to the junior and senior years of established institutions.

This development alone, however, would not solve our problem. We must develop hospitals at the State Normal Schools and State University, where proper health and medical instruction can be given not only to the teacher but to the leaders of public opinion, who will naturally be educated there. Our State University has made notable advancement in the health education of its students. The Eastern Kentucky Normal School has also moved forward in this respect but each of these institutions, in addition, should have hospitals with perfectly equipped teaching staffs, who could take a sufficient number of internes to entirely examine all of the student body, remedying their defects so far as possible and treating their illnesses. If these internships are reserved for scholars provided by such State aid as has heretofore been suggested, the students might well be expected to return to the counties from which they are sent and there man the smaller or larger hospital, which will develop as rapidly as public opinion demands them. We already have many hospitals of the older type, many of which have been giving effective service these many years. The profession will be interested in the development of the Community Hospital at Glasgow and will watch eagerly its attempt to perform all of the functions of a hospital, including interne training as well as nurses' training. Probably the first step should be the establishment of adequate teaching hospitals at each of the state institutions of higher education under the state aid plan and the development of county or district hospitals wherever they have already developed full time health departments.

From year to year, since 1912, the Council has asked the attention of the House of Delegates to this problem. We especially suggest

that the members of the House read again our report for last year in this connection. The only argument that can be presented against the effectiveness of our plan of medical organization would be its failure to recognize and solve this problem. Our General Assembly and our people have for many years made it plain that they are willing to accept our leadership. If we fail, however, to reform ourselves, the enactment of the chiropractic law at the last session gives us an indication that an unwise and dangerous solution will be brought about by those who are wholly untrained in the entire subject. Our problem will be settled wisely, so far as Kentucky is concerned, upon the recommendations of this body and it is important that we give it our immediate attention. The shrewd political manipulators, who have been managing the attacks on the medical profession for the past several years have attempted to center them on a few individuals who have been made prominent because they have had the confidence of our profession. The profession, of course, realizes and the people must be made to see that this is but a blind. The State Board of Health has the responsibility for the selection of a very large number of officials. The selfish interests behind this Ripper legislation have always attempted to make such political combinations with sections of factions of either party with the purpose of securing control of our medical organization and the patronage of the State Health Department that both and all may be prostituted for partisan purposes.

It is a pleasure to note that our affairs are in excellent shape. The total assets of the Association this year are \$16,375.90 as against \$13,633.89 last year. While the balance on hand in the checking account has been reduced from \$7,872.23 to \$5,074.81, this is more than covered by the transfer of \$5,000.00 to an interest bearing savings account. We note with considerable pride that the income from the JOURNAL was \$9,404.21, while the cost of its publication was \$8,086.32. This favorable financial situation has resulted from a continuation of the advertising income from the JOURNAL, which has enabled us to keep a small balance above operating expenses for all but two of the last twenty-five years. The editor has continued to comply with the policy of this House of publishing practically all of the articles submitted by the members of the county societies as well as the scientific proceedings of the sessions of this Association. At times we have been criticized by those familiar with other scientific publications because of this. We merit and invite such criticism.

A study of the progress of the profession from year to year, or, even more striking,

from decade to decade, as indicated by the pages of the JOURNAL, can only afford gratification to our thoughtful members. The JOURNAL is intended to be a cross section of professional opinion in Kentucky, for the month in which it is printed. Viewed from this point, each JOURNAL is a milestone of progress, which indicates that our people today are being given the most effective medical service they have ever had. This is not only no reflection upon our predecessors in the profession, but, it is, indeed, proof that our predecessors built wisely the great organization, for which we are now responsible.

For the past six years the Association has co-operated with the State Board of Health in the enforcement of medical practice and other health laws. The House, last year, authorized an expenditure not to exceed \$2,400.00, but, fortunately we were called upon for only \$300 of this. Under our unfortunate and clumsy system of court procedure, the constantly changing County and Commonwealth's Attorneys, elected under our partisan and political system, too frequently results in the selection of men who are not sufficiently energetic or interested in law enforcement to effectively enforce the medical and health, or, in fact, any of the other laws of the Commonwealth. It is indeed surprising, under such a system, that the majority are such good officers. Realizing, as physicians do, the vital importance of the enforcement of the health and medical laws, it is natural that irritation will frequently arise amongst them, because of failure in their enforcement. In those sections of the State where physicians have joined with other progressive organizations of citizens in the selection of worthwhile attorneys as court officials, there has arisen no complaint. Complaints of evasion of the law come from the poorly organized counties and districts which continue to select these officials, as reward for political service, or, because of the predominating influence of some special interest, and it is apparent that it will be impossible to improve conditions in these sections until public opinion has been educated as to the importance of the selection of competent officials. This year, again, our attorneys have assisted in the preparation of more than 300 cases, and they have been effectively aided by the Commonwealth and County Attorneys in many sections of the State. Again we would report more convictions for violation of health and medical laws than ever before.

We are again able to report that the careful management of the Medico Legal Committee has reduced the cost of attorney's fees, which, for the past year was \$1,225.00 as against \$1,325.00 for 1928 and \$2,375 for 1927.

Court costs and expenses for the past year were \$93.30 as against \$224.37 for 1928 and \$562.14 for 1927.

We regret to report that there is no decrease in the number of such unjust black-mail suits against reputable members of the profession. The Council again calls to your appreciated attention the very effective work of Honorable Fred Forcht, the general counsel of this committee, who has given so generously of his time for many years for a quite nominal remuneration. The Council is especially gratified with Mr. Forcht's restoration to good health. Dr. J. B. Lukins, chairman of the committee, has devoted much time and thought to his work which he has conducted most successfully.

It is very important that physicians, generally, carefully consider the character of such malpractice suits as are being brought. To this end they are urged to read thoughtfully the decisions of the Courts published currently in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. It is evident from careful study of such cases that there has not been a suit decided against a reputable physician in many years which could not have been prevented, if the legal precautions which should now be known to all of us had been taken at the right time. The whole subject of malpractice procedure has become definitely technical, and, in order to avoid becoming victims of injustice from its operation, physicians must acquaint themselves with these procedures, as they do with the other complexities of modern medicine.

Again this year a considerable number of physicians have been convicted in the State or Federal courts for violation of the narcotic or prohibition laws. Acting under your instructions, the Council has, or will, when their penitentiary terms have expired, prefer charges against each of them with the view of revocation of their certificates to practice medicine in Kentucky. The Council finds that the administration of these laws, which are approved by a vast majority of the physicians of Kentucky, has been made unnecessarily irksome to the competent, honest, self-respecting members of the medical profession by their violation by the very small minority who have continued to ignore their plain purposes and provisions. Regardless of individual opinion as to the wisdom of such a law, it is now well known by every physician in Kentucky, and in every possible way the public should be taught, that, under Federal law, narcotic habits are not considered as having a disease and that they cannot be treated by providing narcotics under any circumstances. It is equally plain that alcohol in any form can only be prescribed legally for patients,

who have actually been examined by, and who are under the treatment of the physician writing the prescription for a definite disease in which such alcoholic medication is indicated. It is with regret that the Council notes the reports of the Federal authorities that they are finding frequently prescriptions for alcoholic beverages signed by physicians who have not only not examined these patients, but they have not infrequently been issued in fictitious names, and that, in some instances, these prescriptions were filled for the physicians themselves. Such action is a breach of trust that is absolutely inexcusable and any member of our profession who prostitutes the duty imposed upon him by law, of determining whether medicines containing alcohol shall be used in the treatment of disease, deserves no sympathy when he is indicted and imprisoned. The Council desires to repeat again that the officials charged with the enforcement of these laws cannot relax their strict constructions of their provisions, which seem to most of us frequently unnecessarily harsh, until the people have been protected from the class of negligent or soft-headed, soft-hearted physicians who pander to this trade and practice in violation of the law.

During the past year there has been a considerable increase in the number of county societies which have held diagnostic clinics along the various lines which have been endorsed in our reports for the last ten years. This has been particularly true in tuberculosis, and no other factor has been of greater assistance in reducing the sick and death rate from this serious disease than these clinics. Careful investigation, extending over many years, has shown that the climate of Kentucky is quite as good as that of any other state for the care of those afflicted with tuberculosis. This has been indicated by the results secured in the splendidly conducted county hospitals in Jefferson and Fayette Counties, and in our State Tuberculosis Sanatorium, Hazelwood, in the suburbs of Louisville. It is unfortunate that there are only 12 free beds in Kentucky for the indigents suffering with tuberculosis outside of Jefferson and Fayette Counties.

Numerous diagnostic clinics for crippled children have been held by various societies in co-operation with the Kentucky Crippled Children Commission, associated with Rotary and Kiwanis Clubs, Shriners and other similar organizations. It is a pleasure to again commend this very effective work under the fine leadership of Miss Marian Williamson, who has so long and effectively served the people of Kentucky. Hundreds of children are being restored to usefulness that had heretofore been doomed to a life of invalidism and suffering.,

Many county societies have held Trachoma and other eye, ear and throat clinics for the indigents in their population. Such clinics are under the exclusive control of the county society holding them and they have unquestionably popularized such simple operative procedures, particularly amongst the indigent school children, and have made hundreds of the more fortunate of our people seek similar services. Trachoma is rapidly disappearing. For the first ten years after this work was organized under the leadership of Doctor John McMullen, of the United States Public Health Service, anywhere from 50 to 100 patients were operated on at the various clinics, and it was necessary to establish temporary trachoma hospitals in many points in the State over periods of several years. For the past year, in Doctor Kobert's effective work, it has been rare to find more than a half dozen cases, even in those counties having all-time health departments, who are on the constant lookout for this disease.

We again call to your attention the Irvine-McDowell Memorial Hospital for Trachoma, located at Richmond. This beautiful building and grounds were bequeathed to the Kentucky State Medical Association by Mrs. Elizabeth Irvine as a memorial to her grandfather, Ephraim McDowell, the immortal "father of ovariectomy." The State Association has loaned it to the State Board of Health, which is, in conjunction with the United States Public Health Service, financing the conduct of the hospital, the latter providing one of its accomplished surgeons as officer in charge of the institution.

For the seven of the past eight years the General Assembly has continued its appropriation for the support of the Bureau of Maternal and Child Health. Under the fine leadership of Doctor Veech and her associates in this Bureau, with the splendid co-operation of the entire profession throughout the State, the maternal death rate has been reduced practically a third, and infant mortality almost a half. This is the best answer to the critics of the Sheppard-Tower legislation, which has always met and merited the unanimous approval of this Association. Due to a total misconception of its aims and purposes, and to other recognized causes which it is hardly necessary to mention here, the Federal Sheppard-Towner appropriation was permitted to expire June 30, 1929. Our people and the Legislature recognized so fully the necessity for continuing this constructive work that the appropriation for this purpose was passed unanimously by both Houses, but was, unfortunately, vetoed by the Governor. This has meant the loss of about two-fifths of the personnel of the Board of Health for the fiscal year beginning July 1, 1929, and has

thrown a greatly increased responsibility on the medical profession and health departments in the several counties of the State. Those counties with all-time health departments will be prepared to meet this responsibility in part. To every county in the State, however, it means a real calamity. In this era of progress in public health, Kentucky would have been advertised as the only State in the Union which is taking no part in the problem presented by the high death rate amongst its mothers and children had it not been for the prompt action of a group of interested citizens who have voluntarily subscribed \$25,000.00 to enable Dr. Veech's Bureau to continue a portion of its activities until the next session of the Legislature. It is confidently expected that this situation will then be corrected. To this end it is important that the members of the profession should constantly be bringing all these matters to the attention of the public so that they will understand that physicians are interested in public welfare. It is urged that county societies continue to hold public meetings in various sections of each county where the public may be educated in regard to these necessary measures and that clinics be held at the county societies for the demonstration of prophylactic vaccines for the indigent. If this were done actively in every county it would reduce our sick and death rate to that of other states in which these things are done. It should be constantly emphasized that good roads and good schools will be of value only to healthy children and adults.

Last year the House appropriated an amount not to exceed \$200.00 a month to pay the expenses of additional organization; of this amount \$1,500 was expended. It is recommended that this same appropriation be continued for next year.

The financial report by the Secretary and Treasurer is in great detail and we urge that every member, and especially every member of the House of Delegates, read it carefully and thoughtfully.

The Council desires to again emphasize that the JOURNAL has been published at a profit, because of its continued support by our advertisers. The importance of the patronage of these advertisers by our members cannot be given too much emphasis. The value of the JOURNAL to every reader is apparent. This Association guarantees the financial integrity of the advertising columns of the JOURNAL. For these reasons we feel we have a right to ask our members to give our advertisers their patronage; other things being equal.

These same remarks apply to the exhibits at the annual meetings. These exhibitors pay the expenses of the scientific sessions. They

are carefully selected from among a large number of applicants by a special committee of the Council and they exhibit the annual improvements in medical and surgical technique in a very effective way. The exhibit this year is particularly interesting, and the Council desires to urge those in attendance to carefully study it.

The Council desires to express its cordial appreciation to those counties which have organized a Woman's Auxiliary. It urges every other county to organize as rapidly as possible. The report of this fine organization indicates that in the few years since the Crab Orchard Meeting, at which it was developed, it has secured a larger membership than this Association did in its first 49 years. Its State officers and the officers of its county organizations have displayed a commendable zeal in its work and the Council asks that it be authorized to make such expenditures as may be necessary, to give it every possible aid for the coming year. During the year Hygeia has received many more subscriptions in the counties where the auxiliaries are organized than ever before. During the coming year an attempt will be made to secure 5000 more subscriptions to this important publication of the profession in Kentucky. The Council urges that in every county the wives, widows, mothers and daughters of physicians be organized into an active club which will be continually doing things for the welfare of the State.

The Council desires to again remind the members of the House that they have absolute control of all matters of public policy which affect the practice of medicine and public health in Kentucky. It is the duty of the House of Delegates to instruct its officers exactly how they want this done.

Respectfully submitted,

R. C. McCHORD, M. D.,
Chairman.

Early Diagnosis of Pregnancy.—A recent observation of Dienst's in connection with his pregnancy reaction, is that under normal conditions the antithrombin content of the serum continues to rise during the first and second months of pregnancy and reaches its greatest height in the ninth week. The amount of metathrombin in the urine increases from month to month. It begins to sink shortly before the onset of labor. From this time on there is a predominance of thrombin over antithrombin and metathrombin in blood plasma, serum and urine, and Dienst sees a connection between this predominance of thrombin in the blood and the excitation of the labor pains as well as of various phenomena that precede the onset of labor.

REPORT OF BUSINESS MANAGER

To the House of Delegates:

The following detailed report gives the contents and activities of the Journal for three years:

	1927	1928	1929
No. of pages reading matter	711	720	611
No. of advertising pages.....	454	527	464
Editorials	54	49	54
Scientific editorials.....	0	3	1
Original articles	198	126	134
County Society reports.....	50	53	43
News Items.....	63	65	64
Illustrations	65	53	37

The Journal is a permanent record of the activities of the various County Medical Societies; it publishes every article, County Society report, and news items of its members, and this is accomplished without any expense, as our advertisers pay the cost of the Journal's publication. A most comprehensive detailed financial report is always published before the annual meeting so that every member can become familiar with the expenditures of the association.

The Journal is published under the auspices of the Council, which is composed of eleven members from every section of the State. They determine its policies and solve its problems.

THE INDEX

For the convenience of our members, secretaries, and other officials, a complete index of every item published in the Journal is indexed in the December issue. This enables the County Secretary to keep a permanent record of his County Society and all the papers contributed from his society. The index also gives some idea of the problems various sections of the state encounter by the titles of the papers read before the societies.

OUR EXHIBITS

We have this year been able to secure an unusual number of attractive commercial exhibitors and every doctor is urged to visit them for they contribute materially in paying the expenses of our meeting.

A special department has been delegated to scientific exhibits by our Kentucky doctors and from this small beginning, we hope to increase this work each year, making it of real educational value.

COUNTY SOCIETIES

The office equipment of the association is available to any secretary in preparing letters or notices of the meetings and in mailing out programs and assists in securing speakers. The association is in good condition and its members are actively working toward a goal of better doctors, a wider diffusion of public health knowledge, and a more earnest en-

deavor to make our association and Journal each year bigger and better.

Respectfully submitted,

L. H. SOUTH, M.D.,
Business Manager.

AUDITOR'S REPORT

To the Council of the Kentucky State Medical Association:

Gentlemen: As requested I have made a complete audit of the books and accounts of your Secretary, Dr. A. T. McCormack, and your Treasurer, Dr. W. B. McClure, for the period of September 1, 1928 to and including September 1, 1929.

All receipts were properly accounted for and every item of disbursement is represented by a voucher check signed by the proper officers, and bears the endorsement of the payee.

Every item of receipts and disbursements was followed through the books and found to be charged or credited to the proper account.

The exhibits herewith submitted set forth in detail the financial transactions from several angles and show the true condition of your affairs at this date. The accuracy and system of your records greatly facilitate the audits.

I have also checked the receipts and disbursements, and distribution of funds of the Woman's Auxiliary of the State Medical Association covering period of September 1, 1928 to September 1, 1929 and find them correct as set forth in the several exhibits submitted herewith.

Respectfully,

B. P. EUBANK.

Report of Kentucky State Medical Association, Louisville, Ky., September 1, 1928-September 1, 1929.

Reconciliation of Treasurer's account for period September, 1928 to September, 1929, viz.:

Balance on hand at last report....\$ 11,020.73
Less Vouchers then outstanding..... 3,148.50

Balance agreeing with Secretary's last report....\$ 7,872.23
Amount received from Secretary for period.... 18,653.21

Total\$26,525.44

DISBURSEMENTS

Expense\$16,450.63
Transfer to savings account..... 5,000.00

\$21,450.63

Balance September 1, 1929.....\$ 5,074.81 \$26,525.44

Balance September 1, 1929.....\$ 5,074.81

Reconciliation:
Balance in Second National Bank, Lexington,
Kentucky, Treasurer's Account....\$7,685.92
Vouchers Outstanding, viz.:

No. 84, June 6, 1921, A. P. Hunt.....\$ 1.00
No. 111, January 3, 1922, Dr. V. A.

Stilley..... 6.50

No. 109, June 30, 1929, Dr. L. H.
South..... 100.00

No. 118, June 30, 1929, Clarence
Neighbors..... 100.00

No. 119, July 31, 1929, Dr. A. T.
McCormack..... 150.00

No. 120, July 31, 1929, Dr. L. H. South.....	100.00	
No. 121, July 31, 1929, Elva Grant.....	75.00	
No. 122, July 31, 1929, J. F. Blackerby.....	100.00	
No. 123, July 31, 1929, A. L. Ellerhost.....	10.00	
No. 124, July 31, 1929, Bush Krebs Co.....	9.52	
No. 125, July 31, 1929, Fred Forcht, Atty.....	159.00	
No. 126, July 31, 1929, Times-Journal Publishing Co.....	450.00	
No. 127, August 31, 1929, Dr. A. T. McCormack.....	150.00	
No. 128, August 31, 1929, Dr. L. H. South.....	100.00	
No. 129, August 31, 1929, Elva Grant.....	75.00	
No. 130, August 31, 1929, J. F. Blackerby.....	100.00	
No. 131, August 31, 1929, Times-Journal Publishing Co.....	450.00	
No. 132, August 31, 1929, Times-Journal Publishing Co.....	450.00	
No. 133, August 31, 1929, Woman's Auxiliary Ky. State Med. Assn.....	32.09	\$2,609.11

Balance agreeing with Secretary.....\$ 5,074.31

Vouchers No. 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133 are in the hands of the Secretary to be delivered.

STATEMENT OF ASSETS

Balance in Second National Bank, Lexington, Ky., to the credit of W. B. McClure, Treasurer (checking account).....	\$7,683.92	
Less Vouchers Outstanding.....	2,609.11	
Savings Account.....	\$5,000	\$ 5,074.81
Interest.....	100	5,520.00
Interest on 5 Louisville Title Bonds.....	420	
Total.....		\$10,594.81
Louisville Title Bonds in hands of Treasurer, Face Value.....	5,000.00	
Office Furniture, etc. (See Exhibit "C").....	781.09	
Total.....		\$16,375.90

EXHIBIT "A"

RECEIPTS

Dues from County Societies.....	\$ 9,160.00	
Income of Journal (Exclusive of Investments, etc.).....	9,404.21	
Post Graduate Course.....	89.00	
Interest Louisville Title Bonds No. 3, 5, 8, 13, 40.....	\$420	
Interest on Savings Account.....	100	520.00
Total Receipts.....		\$19,173.21
Balance on hand September 1, 1928.....		7,872.23
Total.....		\$27,045.44

DISBURSEMENTS

STATE MEDICAL ASSOCIATION:		
President's Sundries.....	\$ 10.75	
Secretary Salary.....	1,800.00	
Secretary's Stenographer's Salary.....	900.00	
Secretary's Stamps and Envelopes.....	305.36	
Secretary's Sundries.....	175.88	
Treasurer's Bond and Expense.....	17.50	
Treasurer's Sundries.....	23.00	
Officers', Councilors' and Committee Expenses.....	301.92	
Committee on Public Policy, Expense.....	1,500.00	
Practice Act, Medical Enforcement.....	450.00	
Attorney's Fees, Medico-Legal Committee.....	1,225.00	
Costs and Expenses, Medico-Legal Committee.....	93.30	
Association Sundries.....	240.97	
Post Graduate Course Expense.....	26.00	
Richmond Meeting Expense.....	1,259.63	
Louisville Meeting Expense.....	28.50	
Eye, Ear, Nose and Throat Section Expense.....	6.50	
Total State Medical Association.....		\$8,594.31

KENTUCKY MEDICAL JOURNAL:		
Business Manager's Salary.....	\$ 1,200.00	
Business Manager's Sundries.....	12.80	
Journal Advertisement Collections Paid Woman's Auxiliary, Kentucky State Medical Association.....	32.09	
Journal Printing.....	6,106.84	
Journal Postage.....	200.00	
Journal Sundries.....	534.59	

Total Journal.....\$ 8,086.32

Grand Total.....\$16,450.63

Balance on hand this date.....10,594.81

Total.....\$27,045.44

EXHIBIT "B"

Detailed list of receipts from County Societies from September, 1928 to September, 1929, compared with incomes of same period last year:

	1928	1929
Adair.....	\$ 35.00	\$ 50.00
Allen.....	50.00	50.00
Anderson.....	40.00	55.00
Ballard.....	40.00	40.00
Barren.....	60.00	70.00
Bath.....	30.00	45.00
Bell.....	130.00	120.00
Boone.....	10.00	10.00
Bourbon.....	100.00	90.00
Boyd.....	265.00	260.00
Boyle.....	45.00	70.00
Bracken.....	45.00	50.00
Breathitt.....	30.00	20.00
Breckinridge.....	65.00	70.00
Bullitt.....	10.00	45.00
Butler.....	15.00	10.00
Caldwell.....	60.00	60.00
Calloway.....	95.00	85.00
Campbell-Kenton.....	405.00	600.00
Carlisle.....	40.00	45.00
Carroll.....	45.00	35.00
Carter.....	55.00	25.00
Casey.....	20.00	15.00
Christian.....	180.00	150.00
Clark.....	115.00	105.00
Clay.....	30.00	45.00
Clinton.....	20.00	15.00
Crittenden.....	45.00	35.00
Cumberland.....	35.00	40.00
Daviess.....	220.00	210.00
Elliott.....		
Estill.....	50.00	45.00
Fayette.....	465.00	475.00
Fleming.....	55.00	50.00
Floyd.....	45.00	20.00
Franklin.....	105.00	100.00
Fulton.....	40.00	65.00
Gallatin.....	15.00	5.00
Garrard.....	20.00	30.00
Grant.....	55.00	10.00
Graves.....	130.00	125.00
Grayson.....	40.00	35.00
Green.....	25.00	30.00
Greenup.....	35.00	40.00
Hancock.....		
Hardin.....	95.00	115.00
Harlan.....	200.00	175.00
Harrison.....	75.00	75.00
Hart.....	35.00	25.00
Henderson.....	95.00	80.00
Henry.....	55.00	50.00
Hickman.....	40.00	35.00
Hopkins.....	120.00	110.00
Jackson.....	20.00	5.00
Jefferson.....	1,992.50	2,040.00
Jessamine.....	55.00	60.00
Johnson.....	35.00	40.00
Knott.....	5.00	5.00
Knox.....	55.00	60.00
Larue.....	40.00	45.00
Laurel.....	40.00	40.00
Lawrence.....	40.00	40.00
Lee.....		5.00
Leslie.....	10.00	5.00
Letcher.....	75.00	60.00
Lewis.....	20.00	20.00
Lincoln.....	55.00	55.00
Livingston.....	35.00	30.00
Logan.....	85.00	85.00
Lyon.....	20.00	20.00
McCracken.....	235.00	225.00
McCreary.....	25.00	25.00
McLean.....	35.00	20.00
Madison.....	170.00	155.00
Magoffin.....	5.00	5.00
Marion.....	60.00	45.00
Marshall.....	70.00	65.00
Martin.....	5.00	5.00
Mason.....	60.00	60.00
Meade.....	10.00	10.00
Menifee.....		5.00
Mercer.....	80.00	65.00
Monroe.....	20.00	40.00
Metcalfe.....	25.00	25.00
Montgomery.....	60.00	65.00
Morgan.....	5.00	15.00
Muhlenberg.....	75.00	85.00
Nelson.....	55.00	60.00
Nicholas.....	50.00	50.00
Ohio.....	50.00	45.00
Oldham.....	50.00	40.00

Owen	30.00	30.00
Owsley	5.00	10.00
Pendleton	40.00	40.00
Perry	175.00	180.00
Pike	85.00	85.00
Powell	10.00	—
Pulaski	45.00	45.00
Robertson	5.00	5.00
Rockcastle	5.00	10.00
Rowan	10.00	10.00
Russell	25.00	25.00
Scott	75.00	65.00
Shelby	70.00	65.00
Simpson	55.00	55.00
Spencer	—	15.00
Taylor	40.00	45.00
Todd	25.00	25.00
Trigg	10.00	35.00
Trimble	—	5.00
Union	80.00	50.00
Warren	65.00	170.00
Washington	45.00	40.00
Warne	30.00	25.00
Webster	45.00	—
Whitley	145.00	125.00
Wolfe	—	15.00
Woodford	15.00	45.00
	\$8,992.50	\$9,160.00

EXHIBIT "C"

Invoice of the property of the Association:
September 1, 1929.

Addressograph plates, 5000 complete addressed	\$300.00
1 Remington Typewriter	25.00
1 Desk	50.00
1 Typewriter Chair	9.00
1 Filing Cabinet	64.75
Rubber Stamps	9.00
Guide Cards	5.00
1-3 Adding Machine	75.00
1 Electric Fan	18.00
1 Globe Safe with Fixtures	130.00
Total	\$685.75
70 per cent reduction for depreciation	480.02
Total Old Property	\$205.73

1 N. F. 2 Addressograph and Ejector	\$285.00
Less 10 per cent depreciation	28.50
1 M Membership cards	13.50
10 M No. 5 2-cent envelopes	216.00
4 M No. 8 2-cent envelopes	89.36
	\$781.09

EXHIBIT "D"

Secretary's Monthly Balance Sheet, agreeing with books.

September 1, Balance on hand	September 1, 1928	September 1, 1929
Expenses	Collections	Balance
October 1	\$2,716.05	\$2,678.40
November 1	1,941.39	1,511.32
December 1	1,858.88	682.75
January 1	854.54	134.89
February 1	1,394.02	3,095.40
March 1	1,040.30	2,522.15
April 1	1,258.98	2,480.93
May 1	1,209.36	2,701.48
June 1	1,097.48	1,996.45
July 1	1,178.02	—
August 1	1,044.52	849.44
September 1	1,357.09	—
	\$16,450.63	\$18,653.21
Balance on hand September 1, 1928	7,872.23	26,525.44
Balance on hand September 1, 1929	10,074.81	—
Total Expenses	\$16,450.63	26,525.44

EXHIBIT "E"

Collections by Secretary on account of Kentucky State Medical Association, corresponding with checks, deposit slips and receipts, filed:

October 1—To Collections to date	\$ 252.50
November 1—To Collections to date	100.00
December 1—To Collections to date	25.00
January 1—To Collections to date	35.00
February 1—To Collections to date	1,445.00
March 1—To Collections to date	2,010.00
April 1—To Collections to date	1,530.00
May 1—To Collections to date	1,877.50
June 1—To Collections to date	1,400.00
August 1—To Collections to date	485.00
Total for Year	\$9,160.00

EXHIBIT "F"

Collections by Editor on account of the Journal, corresponding with checks, deposit slips and receipts filed

1928-29	
October 1—To Collections to date	\$2,425.90
November 1—To Collections to date	1,322.32
December 1—To Collections to date	657.75
January 1—To Collections to date	99.89
February 1—To Collections to date	1,650.40
March 1—To Collections to date	512.15
April 1—To Collections to date	950.93
May 1—To Collections to date	823.98
June 1—To Collections to date	596.45
August 1—To Collections to date	364.44
Total for Year	\$9,404.21
1928	
November 1—Post Graduate Course	89.00
Total Receipts	\$9,493.21

EXHIBIT "G"

Total membership by Councilor Districts and by Counties for 1929 as compared to that of 1928.

First District—V. A. Stilley, Benton, Councilor.

	1928	1929
Ballard	8	8
Caldwell	11	12
Calloway	18	17
Carlisle	8	9
Crittenden	9	7
Fulton	8	12
Graves	25	25
Hickman	8	7
Livingston	6	4
Lvon	4	4
Marshall	14	13
McCracken	47	45
Trigg	2	7
	168	170

Second District—D. M. Griffith, Owensboro, Councilor.

	1928	1929
Daviess	43	41
Hancock	—	—
Henderson	16	15
Hopkins	24	22
McLean	6	4
Muhlenberg	12	16
Ohio	10	9
Union	16	10
Webster	9	—
	136	117

Third District—C. C. Howard, Glasgow, Councilor

	1928	1929
Allen	10	10
Barren	12	14
Butler	2	2
Christian	34	30
Cumberland	7	8
Logan	16	17
Metcalfe	5	5
Monroe	4	8
Simsion	11	11
Todd	5	5
Warren-Edmonson	13	22
	119	132

Fourth District—D. E. McClure, Elizabethtown, Councilor.

	1928	1929
Breckinridge	13	13
Bullitt	2	3
Gravson	8	7
Hardin	19	22
Hart	7	5
Larue	8	8
Meade	2	1
Nelson	11	12
Spencer	—	3
	70	74

Fifth District—W. E. Gardner, Louisville, Councilor.

	1928	1929
Carroll	9	7
Franklin	21	20
Gallatin	3	1
Henry	11	9
Jefferson	385	397
Oldham	10	8
Owen	6	6
Shelby	14	13
Trimble	—	1
	459	462

Sixth District—R. C. McChord, Lebanon, Councilor.		
	1928	1929
Adair	7	10
Anderson	8	10
Boyle	9	12
Green	5	6
Marion	11	9
Mercer	16	13
Taylor	8	9
Washington	9	8
	73	77

Seventh District—V. G. Kinnaird, Lancaster, Councilor.		
	1928	1929
Casey	4	3
Clinton	4	3
Garrard	4	6
Lincoln	11	11
McCreary	5	5
Pulaski	9	8
Rockcastle	1	2
Russell	5	5
Wayne	5	5
	48	48

Eighth District—C. W. Shaw, Alexandria, Councilor.		
	1928	1929
Boone	2	2
Bracken	9	10
Campbell-Kenton	78	107
Fleming	11	10
Grant	11	2
Harrison	15	15
Mason	10	10
Nicholas	10	10
Pendleton	8	8
Robertson	1	1
	155	175

Ninth District—S. C. Smith, Ashland, Councilor.		
	1928	1929
Boyd	52	52
Carter	11	5
Elliott	—	—
Floyd	8	3

Tenth District—C. A. Vance, Lexington, Councilor.		
	1928	1929
Bath	5	8
Bourbon	16	17
Breathitt	6	4
Clark	22	21
Estill	10	9
Fayette	90	91
Jessamine	11	12
Lee	—	—
Madison	33	30
Menifee	—	—
Montgomery	12	13
Morgan	1	3
Powell	2	—
Rowan	2	2
Scott	15	13
Wolfe	—	3
Woodford	3	9
	228	235

Eleventh District—W. M. Martin, Harlan, Councilor.		
	1928	1929
Bell	26	22
Clay	6	8
Harlan	40	35
Jackson	4	1
Knott	1	1
Knox	11	11
Laurel	8	8
Leslie	2	1
Letcher	14	12
Owsley	1	2
Perry	33	35
Whitley	28	25
	174	161

EXHIBIT 'H'

Detailed Statement of Disbursements of W. B. McClure, Treasurer, Kentucky State Medical Association, each made on a Voucher Check signed by Dr. J. H. Blackburn, President, Dr. A. T. McCormack, Secretary, and himself, from September 1, 1928 to September 1, 1929.

1928			
September 1—Voucher Check No. 1.....	\$	300.00	
J. F. BLACKERBY, Louisville,			
To special services rendered Committee on Public Policy,			
June, July and August at \$100.00 each.....			
September 1—Voucher Check No. 2.....		47.92	
PENDENNIS CLUB, Louisville,			
To dinner meeting of Council.....			
September 29—Voucher Check No. 3.....		186.50	
Dr. A. T. McCORMACK, Louisville,			
To September salary, Secretary.....	\$150.00		
To sundry expense at Richmond meeting.....	36.50		
Approved by Council and Ordered Paid by House of Delegates.....			
September 29—Voucher Check No. 4.....		112.80	
Dr. L. H. SOUTH, Louisville,			
To September salary, Business Manager.....	100.00		
To expense at Richmond meeting.....	12.80		
Approved by Council and Ordered Paid by House of Delegates.....			
September 29—Voucher Check No. 5.....		111.10	
ELVA GRANT, Louisville,			
To September salary, Bookkeeper.....	\$ 75.00		
To Honorarium.....	20.00		
To expense at Richmond meeting.....	16.10		
Approved by Council and Ordered Paid by House of Delegates.....			
September 29—Voucher Check No. 6.....		63.41	
MAYME SULLIVAN, Louisville,			
To Honorarium.....	\$ 25.00		
To expense at Richmond meeting.....	38.41		
Approved by Council and Ordered Paid by House of Delegates.....			
September 29—Voucher Check No. 7.....		75.80	
Dr. CHAS. A. VANCE, Lexington,			
To expense as Councilor of 10th District.....			
Approved by Council and Ordered Paid by House of Delegates.....			
September 29—Voucher Check No. 8.....		15.00	
J. W. MAUPIN, Richmond,			
To 3 nights' services as watchman.....			
Approved by Council and Ordered Paid by House of Delegates.....			
September 29—Voucher Check No. 9.....		66.80	
Dr. D. M. Griffith, Owensboro,			
To expense as Councilor of 2nd District.....			
Approved by Council and Ordered Paid by House of Delegates.....			

September 29—Voucher Check No. 10.....	60.80
B. P. EUBANK, Bowling Green, To auditing books and accounts of Ky. State Med. Ass'n and Woman's Aux., K. S. M. A.....	50.00
To expense and RR fare.....	10.80
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 11.....	12.92
MEFFERT EQUIPMENT CO., Louisville, To 1 M Cards.....	\$ 6.00
To 1 Card Box and Guide.....	1.12
To 1500 Cards.....	3.10
To 1 Index and guide.....	2.70
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 12.....	38.50
AMERICAN MEDICAL ASSOCIATION, Chicago, To 2500 Inserts, Photo for Annual Number, Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 13.....	17.50
ADDRESSOGRAPH CO., Chicago, To 1 lister, Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 14.....	28.84
AGNES BLAIR, Louisville, To Honorarium.....	\$ 20.00
To expense at Richmond meeting.....	8.84
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 15.....	250.00
FRED FORCHT, Attorney, Louisville, To services, Jan. 1-June 30, 1928.....	\$150.00
To services, Starr vs. Dulaney case.....	100.00
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 16.....	10.00
MARSHALL JONES, Reporter, Paducah, To reporting case of Dr. Boh C. Overhy vs. G. T. Barnhill, Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 17.....	14.95
DR. D. R. BOTKIN, Hazard, To balance due in case Dr. D. R. Botkin vs Bert Williams. Amount of court costs.....	\$ 20.00
Credit by check No. 163.....	5.05
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 18.....	21.50
DR. W. B. McCCLURE, Lexington, To expense as Treasurer at Richmond meeting.....	16.50
To stamps for Treasurer.....	5.00
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 19.....	69.00
JOHN P. MORTON CO., Louisville, To 600 1928 programs for K. S. M. A. meeting, Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 20.....	109.28
BRAKMEIER BROS., Louisville, To 200 buttons.....	10.00
To 300 gold bars.....	99.28
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 21.....	38.83
CHARLOTTE TAYLOR To Honorarium.....	\$ 20.00
To expense at Richmond meeting.....	18.83
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 20.....	59.50
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To July issue, 23000-88 P.....	\$481.20
To envelopes.....	15.00
To printing envelopes.....	2.30
To inserts.....	5.00
To 30 changes.....	6.00
	\$509.50
Less Ck. No. 177, paid on account.....	450.00
Approved by Council and Ordered Paid by House of Delegates.	
September 29—Voucher Check No. 21.....	51.50
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To August issue, 2300-88 P.....	\$481.20
To envelopes.....	15.00
To printing envelopes.....	2.30
To inserts.....	5.00
To 40 changes.....	8.00
	\$511.50
Less Ck. No. 181, paid on account.....	\$450.00
Less Ky. T. B. Ass'n Ck.....	10.00
	\$460.00
Approved by Council and Ordered Paid by House of Delegates.	
Septemehr 29—Voucher Check No. 22.....	630.45
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To September issue, 2400-92P.....	\$511.84
To 103,574 table set.....	105.81
To 2 sets inserts.....	10.00
To envelopes.....	15.00
To printing envelopes.....	2.30
To 35 changes.....	7.00
	\$651.95
Less by 86 errors @ 25c each.....	21.50
Approved by Council and Ordered Paid by House of Delegates.	

September 29—Voucher Check No. 23.....	23.15	
TIMES-JOURNAL PUBLISHING CO., Bowling Green,		
To 200 Commercial Exhibits.....	\$ 6.00	
To 200 Floor Space Blanks.....	7.00	
To Express on Photos.....	1.06	
To 1 M Index Cards.....	8.50	
Approved by Council and Ordered Paid by House of Delegates.		
September 29—Voucher Check No. 24.....		300.00
MASTER REPORTING CO., Chicago,		
To account of reporting Richmond meeting.		
Approved by Council and Ordered Paid by House of Delegates.		
October 31—Voucher Check No. 25.....		150.00
Dr. A. T. McCORMACK, Louisville,		
To October salary, Secretary.		
October 31—Voucher Check No. 26.....		100.00
DR. L. H. SOUTH, Louisville,		
To October salary, Business Manager.		
October 31—Voucher Check No. 27.....		75.00
ELVA GRANT, Louisville,		
To October salary, Bookkeeper.		
October 31—Voucher Check No. 28.....		300.00
WHEELER & HUGHES, Attorneys, Paducah,		
To attorneys' fee in case Holt vs. Hahs & Thompson.		
October 31—Voucher Check No. 29.....		200.00
J. W. CRAFT, Attorney, Hazard,		
To attorney fee in case of J. B. Elam vs. Dr. D. R. Botkin.		
October 31—Voucher Check No. 30.....		20.30
DR. V. A. STILLEY, Benton,		
To expense as Councilor of 1st District.		
October 31—Voucher Check No. 31.....		52.00
DR. CHARLES C. GARR, Lexington.		
To reimbursement for expense of exhibit at State Meeting.		
October 31—Voucher Check No. 32.....		58.82
RICHMOND LUMBER CO., Richmond,		
To lumber used for exhibit at State meeting.		
October 31—Voucher Check No. 33.....		89.60
DR. JOHN B. FLOYD, Richmond,		
To 14 woolen blankets lost during State Meeting at \$6.40 each.		
October 31—Voucher Check No. 34.....		20.00
E. H. ROEDERER, Louisville,		
To 200 Badges—Blue ribbon and Gold—for State Meeting.		
October 31—Voucher Check No. 35.....		4.00
KOEHLER STAMP & STENCIL CO., Louisville,		
To 1 signature stamp.		
October 31—Voucher Check No. 36.....		5.07
MASTER REPORTING CO., Chicago,		
To reporting annual Kentucky State Medical Meeting, Richmond.....	\$245.50	
To traveling expense.....	56.97	
To postage.....	2.60	
	<u>\$305.07</u>	
Paid on account, Check No. 24.....		300.00
Balance.....		5.07
October 31—Voucher Check No. 37.....		31.80
B. A. JOHNSTON, Shively,		
To installing shelving in vault and doors on cabinet for Medical Journals.		
October 31—Voucher Check No. 38.....		200.00
J. F. BLACKERBY, Louisville,		
To special services rendered Committee on Public Policy for September and October, \$100.00 each.		
October 31—Voucher Check No. 39.....		6.00
DOUGLAS & SIMMONS, Richmond,		
To 2 rolls plaster board for State Meeting at Richmond.		
October 31—Voucher Check No. 40.....		12.50
SAMUEL HINES & CO., Bowling Green,		
To bond for 1 year for Dr. W. B. McClure, Treasurer.		
October 31—Voucher Check No. 41.....		11.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green,		
To 500 letterheads and 500 envelopes, President.....	\$6.50	
To 250 letterheads and 250 envelopes, President-Elect.....	4.50	
October 31—Voucher Check No. 42.....		50.00
CLARENCE NEIGHBORS, P. M., Bowling Green,		
To postage for Journals.		
October 31—Voucher Check No. 43.....		555.80
TIMES-JOURNAL PUBLISHING CO., Bowling Green,		
To October issue—100 P.—2300.....	\$540.00	
To envelopes.....	15.00	
To printing envelopes.....	2.30	
40 changes.....	8.00	
To inserts.....	5.00	
	<u>\$570.30</u>	
Less envelopes not rec'd for this issue.....	15.00	
November 30—Voucher Check No. 44.....		150.00
DR. A. T. McCORMACK, Louisville,		
To November salary, Secretary,		
November 30—Voucher Check No. 45.....		100.00
DR. L. H. SOUTH, Louisville,		
To November salary, Business Manager.		
November 30—Voucher Check No. 46.....		75.00
ELVA GRANT, Louisville,		
To November salary, Bookkeeper.		
November 30—Voucher Check No. 47.....		244.38
MASTER REPORTING CO., Chicago,		
To reporting State Medical Meeting at Richmond:		
To scientific sessions.....	\$180.75	
To carbon.....	24.10	
To surgical session.....	30.75	

To carbon	4.10	
To postage	4.68	
	<u>\$244.38</u>	
November 30—Voucher Check No. 48.....		100.00
H. L. JAMES, Attorney, Elizabethtown, To attorney fee in case Jesse Frye vs. Dr. J. W. Brandon.		
November 30—Voucher Check No. 49.....		42.75
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 8000 letterheads, Secretary.....	\$ 32.00	
To 500 letterheads and 500 envelopes, Eye, Ear, Nose and Throat Section.....	6.50	
To 200 letterheads and 200 envelopes, President.....	4.25	
	<u>\$ 42.75</u>	
November Voucher Check No. 50.....		436.45
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To November issue—76 P.—2200.....	\$422.40	
To envelopes.....	15.00	
To printing envelopes.....	2.30	
To 40 changes.....	8.00	
To inserts.....	5.00	
	<u>\$452.70</u>	
Less by 65 errors at 25c each.....	<u>16.25</u>	
November 30—Voucher Check No. 51.....		100.00
J. F. BLACKERBY, Louisville, To November services rendered Committee on Public Policy.		
November 30—Voucher Check No. 52.....		110.30
DR. CHAS. N. KAVANAUGH, Lexington, To 1-3 expense of Tularemia exhibit.		
December 22—Voucher Check No. 53.....		150.00
DR. A. T. McCORMACK, Louisville, To December salary, Secretary.		
December 22—Voucher Check No. 54.....		100.00
DR. L. H. SOUTH, Louisville, To December salary, Business Manager.		
December 22—Voucher Check No. 55.....		75.00
ELVA GRANT, Louisville, To December salary, Bookkeeper.		
December 22—Voucher Check No. 56.....		7.49
BUSH-KREBS CO., Louisville, To 2 cuts.		
December 22—Voucher Check No. 57.....		3.05
ALEX J. SCHULTZ, Louisville, To 2 pictures.		
December 22—Voucher Check No. 58.....		75.00
HESTER & STAHR Hickman, To legal services in case M. Campbell vs. Dr. J. C. Morrison.		
December 22—Voucher Check No. 59.....		11.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 500 letterheads and 500 envelopes, President-Elect.		
December 22—Voucher Check No. 60.....		333.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To account of December Journal.....	\$400.00	
Less by 108 errors at 25c each.....	\$27.00	
Less by 4 days' delay at \$10.00 each.....	<u>40.00</u>	
	<u>67.00</u>	
December 22—Voucher Check No. 61.....		100.00
J. F. BLACKERBY, Louisville, To December services rendered Committee on Public Policy.		
January 31—Voucher Check No. 62.....		150.00
DR. A. T. McCORMACK, Louisville, To January salary, Secretary.		
January 31—Voucher Check No. 63.....		100.00
DR. L. H. SOUTH, Louisville, To January salary, Business Manager.		
January 31—Voucher Check No. 64.....		75.00
ELVA GRANT, Louisville, To January salary, Bookkeeper.		
January 31—Voucher Check No. 65.....		100.00
J. F. BLACKERBY, Louisville, To January services rendered Committee on Public Policy.		
January 31—Voucher Check No. 66.....		150.00
FRED FORCHT, Attorney, Louisville, To services rendered through December 31, 1928.		
January 31—Voucher Check No. 67.....		1.75
KENTUCKY BOOK MFG. CO., Louisville, To binding Kentucky Medical Journals for 1928.		
January 31—Voucher Check No. 68.....		299.77
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 2250—120 P. December Journal.....	\$638.00	
To 40 changes.....	8.00	
To envelopes.....	15.00	
To printing envelopes.....	2.30	
To inserting inserts.....	5.00	
To 31,465 ems. to 6 pt.....	31.47	
	<u>\$699.77</u>	
Less by 108 errors at 25c each.....	\$27.00	
Less by 4 days' delay at \$10.00 each.....	<u>40.00</u>	
	<u>67.00</u>	
	<u>\$632.77</u>	
	<u>\$333.00</u>	
Credited by Check No. 60.....		504.50
January 31—Voucher Check No. 69.....		
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 2250—88 P. January Journal.....	\$481.20	
To 30 changes.....	6.00	
To envelopes.....	15.00	
To printing envelopes.....	2.30	
	<u>\$504.50</u>	

January 31—Voucher Check No. 70.....	13.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 500 letterheads and 500 envelopes, Treasurer	6.50
To 500 letterheads and 500 envelopes, Coun. 10th D.....	6.50
February 28—Voucher Check No. 71.....	150.00
DR. A. T. McCORMACK, Louisville, To February salary, Secretary.....	
February 28—Voucher Check No. 72.....	100.00
DR. L. H. SOUTH, Louisville, To February salary, Business Manager.....	
February 28—Voucher Check No. 73.....	75.00
ELVA GRANT, Louisville, To February salary, Bookkeeper.....	
February 28—Voucher Check No. 74.....	100.00
J. F. BLACKERBY, Louisville, To February services rendered Committee on Public Policy.....	
February 28—Voucher Check No. 75.....	100.00
J. D. VIA, Attorney, Clinton, To attorney fee in case Dr. R. T. Rudd vs. Commonwealth of Kentucky.....	
February 28—Voucher Check No. 76.....	50.00
CLARENCE NEIGHBORS, P. M., Bowling Green, To postage for Journals.....	
February 28—Voucher Check No. 77.....	465.30
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 2250—80 P. February Journal.....	\$442.00
To envelopes	15.00
To printing envelopes.....	2.30
To 30 changes.....	6.00
	<u>\$465.30</u>
March 30—Voucher Check No. 78.....	200.00
DR. A. T. McCORMACK, Louisville, To March salary, Secretary.....	\$150.00
To expense attending unveiling of Dr. Ephraim McDowell Memorial at Wash- ington, D. C., March 3, 1929 as rep. of Ky. State Med. Assn.....	50.00
March 30—Voucher Check No. 79.....	100.00
DR. L. H. SOUTH, Louisville, To March salary, Business Manager.....	
March 30—Voucher Check No. 80.....	75.00
ELVA GRANT, Louisville, To March salary, Bookkeeper.....	
March 30—Voucher Check No. 81.....	100.00
J. F. BLACKERBY, Louisville, To March services rendered Committee on Public Policy.....	
March 30—Check No. 82.....	15.00
ELECTRIC BLUE PRINT & SUPPLY CO., Louisville, To 260 exhibit space blue print for 1929 State Meeting.....	
March 30—Voucher Check No. 83.....	200.00
J. D. MOCQUOT, Attorney, Paducah, To attorney fee in case Ruth Harton vs. F. A. Jones.....	
March 30—Voucher Check No. 84.....	79.73
WESTERN UNION TELEGRAPH CO., Louisville, To telegrams in interest of Newton Bill.....	
March 30—Voucher Check No. 85.....	10.75
FRED HAUPT CO., Louisville, To design to Dr. McChord.....	
March 30—Voucher Check No. 86.....	478.50
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To 2300—84 P March Issue.....	\$461.60
To 3 M envelopes.....	15.00
To printing envelopes.....	2.30
To 40 changes.....	8.00
	<u>\$486.90</u>
Less 40 Journals short at 21c each.....	<u>8.40</u>
April 30—Voucher Check No. 87.....	150.00
DR. A. T. McCORMACK, Louisville, To April salary, Secretary.....	
April 30—Voucher Check No. 88.....	100.00
DR. L. H. SOUTH, Louisville, To April salary, Business Manager.....	
April 30—Voucher Check No. 89.....	75.00
ELVA GRANT, Louisville, To April salary, Bookkeeper.....	
April 30—Voucher Check No. 90.....	100.00
J. F. BLACKERBY, Louisville, To April services rendered Committee on Public Policy.....	
April 30—Voucher Check No. 91.....	22.65
J. D. MOCQUOT, Attorney, Paducah, To court costs in case of Ruth Harton vs. F. A. Jones.....	
April 30—Voucher Check No. 92.....	24.20
BRAHAM & LONGSTREET, Louisville, To taking depositions, case Dr. H. T. C. Richmond vs. H. B. & A. Hill.....	
April 30—Voucher Check No. 93.....	10.00
CHARLES W. GOULD, Attorney, Milford, Mass., To taking depositions in case Dr. H. T. C. Richmond vs. H. B. & A. Hill.....	
April 30—Voucher Check No. 94.....	1.50
A. L. ELLERHOST, Louisville, To taking deposition in case Dr. H. T. C. Richmond vs. H. B. & A. Hill.....	
April 30 Voucher Check No. 95.....	116.43
LUDLOW PETTY, P. M., Louisville, To 10 M No. 5 2c envelopes.....	\$216.00
To 4 M No. 8 2c envelopes.....	89.36
	<u>\$305.36</u>
First Payment	<u>\$116.43</u>
Balance	<u>\$188.93</u>

April 30—Voucher Check No. 96.....	188.93
LUDLOW PETTY, P. M., Louisville,	
To 10 M No. 5 2c envelopes.....	\$216.00
To 4 M No. 8 2c envelopes.....	89.56
	305.36
First Payment.....	116.43
	\$188.93
Second Payment.....	
April 30—Voucher Check No. 97.....	6.50
TIMES-JOURNAL PUBLISHING CO., Bowling Green,	
To 500 letterheads and 500 envelopes, President-Elect.	
April 30—Voucher Check No. 98.....	13.50
CLERK JEFFERSON COUNTY COURT, Louisville,	
To 3 certified copies of Articles of Incorporation of the Kentucky State Medical Association and recording copy of Articles of Incorporation.	
April 30—Voucher Check No. 99.....	400.65
TIMES-JOURNAL PUBLISHING CO., Bowling Green,	
To 2300—84 P. April Issue.....	\$469.60
To envelopes.....	15.00
To printing envelopes.....	2.30
	\$486.90
Less 7 1-2 days' delay at \$10.00 per day.....	\$75.00
Less 45 errors at 25c each.....	11.25
	86.25
May 31—Voucher Check No. 100.....	195.25
DR. A. T. McCORMACK, Louisville,	
To May salary, Secretary.....	\$150.00
To expense to Murray, Mayfield, Paducah, Henderson and Owensboro.....	45.25
May 31—Voucher Check No. 101.....	100.00
DR. L. H. SOUTH, Louisville,	
To May salary, Business Manager.	
May 31—Voucher Check No. 102.....	87.13
ELVA GRANT, Louisville,	
To May salary, Bookkeeper.....	\$ 75.00
To expense to Frankfort.....	12.13
May 31—Voucher Check No. 103.....	100.00
J. F. BLACKERBY, Louisville	
To May services rendered Committee on Public Policy.	
May 31—Voucher Check No. 104.....	.90
MEFFERT EQUIPMENT CO., Louisville,	
To 1 box 6 3-4 Tiger Envelopes.	
May 31—Voucher Check No. 105.....	62.60
PENDENNIS CLUB, Louisville,	
To dinners for Councilors.	
May 31—Voucher Check No. 106.....	13.50
TIMES-JOURNAL PUBLISHING CO., Bowling Green,	
To 250 Exhibit Blanks.....	\$ 6.25
To 250 Application for Space Blanks.....	7.25
May 31—Voucher Check No. 107.....	538.10
TIMES-JOURNAL PUBLISHING CO., Bowling Green,	
To 2200—96 P. May Journal.....	\$514.80
To 30 changes.....	6.00
To envelopes.....	15.00
To printing envelopes.....	2.30
	\$538.10
June 29—Voucher Check No. 108.....	150.00
DR. A. T. McCORMACK, Louisville,	
To June salary, Secretary.	
June 29—Voucher Check No. 109.....	100.00
DR. L. H. SOUTH, Louisville,	
To June salary, Business Manager.	
June 29—Voucher Check No. 110.....	75.00
ELVA GRANT, Louisville,	
To June salary, Bookkeeper.	
June 29—Voucher Check No. 111.....	100.00
J. F. BLACKERBY, Louisville,	
To June services rendered Committee on Public Policy.	
June 29—Voucher Check No. 112.....	17.82
MAYME SULLIVAN, Louisville,	
To 250 return postal cards.....	\$ 5.00
To 600 2c stamped envelopes (Jane Todd Crawford Memorial letter).....	12.82
	\$ 17.82
June 29—Voucher Check No. 113.....	150.00
RODES & HARLIN, Bowling Green,	
To attorney fee in case of Chism vs. Drs. Graves and Meredith.	
June 29—Voucher Check No. 114.....	6.50
FRANKLIN PRINTING CO., Louisville,	
To 500 Certificates for Post-Graduate Course.	
June 29—Voucher Check No. 115.....	19.50
BRACKMEIER BROS., Louisville,	
To 500 Celluloid Buttons for Post-Graduate Course.	
June 29—Voucher Check No. 116.....	11.50
TIMES-JOURNAL PUBLISHING CO., Bowling Green,	
To 1300 reprints—Address of Ralph Gilbert.	
June 29—Voucher Check No. 117.....	447.70
TIMES-JOURNAL PUBLISHING CO., Bowling Green,	
To 2200—76 P. June Journal.....	\$422.40
To 40 changes.....	8.00
To envelopes.....	15.00
To printing envelopes.....	2.30
	\$447.70

June 29—Voucher Check No. 118.....	100.00
CLARENCE NEIGHBORS, P. M., Bowling Green, To postage for Journal.	
July 31—Voucher Check No. 119.....	150.00
DR. A. T. McCORMACK, Louisville, To July salary, Secretary.	
July 31—Voucher Check No. 120.....	100.00
DR. L. H. SOUTH, Louisville, To July salary, Business Manager.	
July 31—Voucher Check No. 121.....	75.00
ELVA GRANT, Louisville, To July salary, Bookkeeper.	
July 31—Voucher Check No. 122.....	100.00
J. F. BLACKERBY, Louisville, To July services rendered Committee on Public Policy.	
July 31—Voucher Check No. 123.....	10.00
A. L. ELLERHOST, Louisville, To services rendered in case Augusta Hill vs. Dr. C. T. Richmond.	
July 31—Voucher Check No. 124.....	9.52
BUSH-KREBS CO., Louisville, To 2 cuts.	
July 31—Voucher Check No. 124.....	150.00
FRED FORCHT, Attorney, Louisville, To services, 1-1-7-129.	
July 31—Voucher Check No. 126.....	450.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To account of July Journal.	
August 31—Voucher Check No. 127.....	150.00
DR. A. T. McCORMACK, Louisville, To August salary, Secretary.	
August 31—Voucher Check No. 128.....	100.00
DR. L. H. SOUTH, Louisville, To August salary, Business Manager.	
August 31—Voucher Check No. 129.....	75.00
ELVA GRANT, Louisville, To August salary, Bookkeeper.	
August 31—Voucher Check No. 130.....	100.00
J. F. BLACKERBY, Louisville, To August services rendered Committee on Public Policy.	
August 31—Voucher Check No. 131.....	450.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To account of August Journal.	
August 31—Voucher Check No. 132.....	450.00
TIMES-JOURNAL PUBLISHING CO., Bowling Green, To account of September Journal.	
August 31—Voucher Check No. 133.....	32.09
WOMAN'S AUXILIARY, KENTUCKY STATE MED. ASSN., Louisville. To 25 per cent commission on ads amounting to \$128.35.	
TOTAL.....	\$16,450.63

EXHIBIT "I"

WOMAN'S AUXILIARY, KENTUCKY STATE MEDICAL ASSOCIATION

RECEIPTS

Gross dues received	\$226.50
Less reimbursement for county dues and dues paid in duplicate	\$ 19.50
American Medical Association Auxiliary	89.50
Net State Dues Received.....	\$ 117.50
Hygeia, American Medical Association, Commission on subscriptions.....	40.12
Contributions from County Auxiliaries.....	67.50
Sundry Receipts.....	78.29
Total Net Receipts.....	\$303.41

DISBURSEMENTS

Southern Medical Association Auxiliary dues.....	\$ 21.00
Sundry Expense	2.50
Expense at State Meeting.....	10.00
Stationary stamps and envelopes.....	67.86
Commission on Hygeia paid counties.....	5.90
Office expense	5.73
Total Disbursements.....	112.99
Net Balance	190.42
Bank Balance, National Bank of Kentucky.....	190.42

Balance in National Bank of Kentucky to date.....	\$242.42
Less Outstanding Vouchers:	
Check No. 114, Mrs. Ed Clay Mitchell.....	\$ 6.00
Check No. 116, Mrs. Irvin Abell.....	22.00
Check No. 118, Mrs. Ed Clay Mitchell.....	2.00
Check No. 119, Mrs. Irvin Abell.....	13.50
Check No. 120, Mrs. Irvin Abell.....	.75
Check No. 121, Mrs. C. H. Jones.....	5.00
Check No. 122, Mrs. Harry Jones.....	2.00
Check No. 125, Mrs. Irvin Abell.....	.25
Check No. 126, Mrs. Irvin Abell.....	.50
Total Checks Outstanding.....	52.00
Balance agreeing with Treasurer's Report.....	\$19.42
Amount collected to date on Jane Todd Crawford Memorial Fund	\$209.00
Interest to date .....	.92
Total	\$209.92
Tax charged by bank.....	.14
Balance on hand.....	\$209.78
Bank balance, First National Bank.....	209.78

1928-1929 MEMBERSHIP

Allen	8	McCracken	14
Ballard	10	Madison	17
Bell	11	Marshall	8
Breckinridge	8	Oldham	5
Calloway	10	Perry	18
Carlisle	5	Taylor	17
Franklin	8	Trigg	2
Garrard	5	Whitley	1
Graves	13	State at large	18
Harlan	25		
Jefferson	135		
Laurel	3	Total	341

EXHIBIT "J"

Detailed Statement of Receipts and Disbursements of Mrs. W. G. Salisbury, Treasurer, Woman's Auxiliary, Kentucky State Medical Association from September 1, 1928, to September 1, 1929.

		Receipts	Disbursements.
September 1	—Cash on hand, received from Miss Mary E. Palmer, Treasurer, 1928.....	\$ 78.40	
September 1	—State Bank Tax.....		.11
September 1	—Dues.....	12.50	
	Jefferson County.....	\$ 1.00	
	Carlisle County.....	3.00	
	Ballard County.....	2.50	
	Perry County.....	2.00	
	State at Large.....	2.00	
	Trigg County.....	2.00	
Sept. 18	—Dues Collected at State Meeting.....	35.00	
	State at Large.....	\$ 18.00	
	Carlisle County.....	1.00	
	Madison County.....	8.00	
	Jefferson County.....	7.00	
	Whitley County.....	1.00	
September 18	—American Medical Association.....	12.75	
	To commission to 1 year's subscription to Hygeia.....		z
September 18	—Dues.....	7.00	
	Jefferson County.....		1.35
October 1	—Check No. 85, Meffert Equipment Co.....		18.50
	To 2 rubber stamps.....		
October 1	—Check No. 86, Mrs. Irvin Abell, Treas.....		1.00
	To American Medical Association Auxiliary dues for 71 members, 3 for 2 years.....		
October 1	—Check No. 87, Mrs. W. Z. Jackson.....		4.00
	To rebate on dues paid in duplicate.....		
October 1	—Check No. 88, Mrs. Geo. C. Leachman, Treas.....		.50
	To rebate due Jefferson County on dues paid direct to state auxiliary.....		
October 1	—Check No. 89, Mrs. W. C. Brvant, Treas.....		.50
	To rebate due on Jarvis dues paid direct to state auxiliary.....		
October 1	—Check No. 90, Mrs. O. R. Kidd, Treas.....		.50
	To rebate due Acree dues paid direct to state auxiliary.....		
October 1	—Check No. 91, Mrs. H. C. Jasner, President.....		10.00
	To rebate due on Hughes dues paid direct to state auxiliary.....		
October 1	—Check No. 92, Mrs. W. G. Salisbury, Treas.....		
	To expense at State Meeting.....		
October 11	—Void Check No. 90, returned by Mrs. Kidd.....	.50	
	Error in County.....		
October 11	—Void Check No. 87, returned by Mrs. Jackson.....	1.00	
	To be credited to Carlisle County per request.....		
October 11	—American Medical Association.....	1.25	
	To Commission on Hygeia.....		
October 11	—Dues.....	2.50	
	Jefferson County.....	\$ 1.50	
	Madison County.....	1.00	
November 1	—American Medical Association.....	20.62	
	To commission on Hygeia.....		
November 1	—Check No. 93, C. T. Dearing Printing Co.....		43.11
	To 1 M letterheads 1 M 2c envelopes.....		
November 1	—Check No. 94, Ludlow Petty, Postmaster.....		2.00
	To stamps.....		
November 1	—Check No. 95, Mrs. Geo. C. Leachman, Treas.....		5.15
	To commission on Hygeia due county.....		
November 1	—Check No. 96, Mrs. Irvin Abell, Treas.....		1.25
	To American Medical Association Auxiliary dues for 5 members.....		
November 1	—Check No. 97, Meffert Equipment Co.....		.68
	To 1 rubber stamp.....		
November 26	—Dues.....	4.00	
	Marshall County.....	\$ 2.00	
	Laurel County.....	1.50	
	Jefferson County.....	.50	
December 1	—Dues.....	2.00	
	Garrard County.....		
December 1	—Contribution to State Treasury.....	5.50	
	Garrard County.....		
December 5	—Contribution to State Treasury.....	15.00	
	Perry County.....		
Dec. 12	—Dues.....	37.00	
	Jefferson County.....	\$ 36.00	
	State at Large.....	1.00	
December 12	—Cash paid by Mrs. Salisbury.....		1.00
	To rebate on dues for two members of Jefferson County paid direct to state.....		
December 12	—Check No. 98, Mrs. Irvin Abell, Treas.....		18.25
	To American Medical Association Auxiliary dues for:		
	Jefferson County.....	\$ 16.75	
	State at Large.....	.25	

Laurel County .....	.75	
Marshall County .....	.50	
December 12—Check No. 99, Mrs. Geo. C. Leachman, Treas. ....		.50
To rebate on Jones dues paid twice.		
Dec. 17—Check No. 100, Mrs. Irvin Abell, Treas. ....		.25
To American Medical Association Auxiliary dues for 1 Jefferson County		
Dec. 27—American Medical Association		1.25
To commission on Hygeia.		
January 8—Contribution to State Treasury		10.00
Donated by Madison County.		
January 8—Dues		5.50
Jefferson County	\$ 1.50	
McCracken County	4.00	
January 21—Dues		1.00
Jefferson County, 1 member for two years.		
January 31—American Medical Association		1.75
To commission on 3 gift subscriptions to Hygeia.		
February 1—Dues		2.00
Jefferson County	\$.50	
McCracken County	1.50	
February 9—Check No. 101, Mrs. Irvin Abell, Treas.		4.00
To American Medical Association Auxiliary dues for 15 members, one for 2 years.		
February 9—Check No. 102, Mrs. Geo. C. Leachman, Treas.		1.25
To rebate on dues	\$.50	
To Hygeia Commission .....	.75	
February 9—Check No. 103, Ludlow Petty, Postmaster.		1.00
To stamps.		
March 4—Contribution to State Treasury		25.00
Donated by Jefferson County.		
March 4—Dues		4.00
Jefferson County	\$ 3.50	
Perry County .....	.50	
March 4—Check No. 104, Mrs. Irvin Abell, Treas.		1.25
To American Medical Association Auxiliary dues for four Garrard and one Perry		
county members		
March 15—Dues, Jefferson County		5.00
March 16—Check No. 105, Mrs. Irvin Abell, Treas.		4.25
To American Medical Association Auxiliary dues for 17 Jefferson County.		
March 21—Dues, Jefferson County		4.00
March 22—Dues, Jefferson County .....		.50
March 23—Dues		2.50
Ballard County	\$ 2.00	
Jefferson County .....	.50	
March 26—Dues, Jefferson County		1.50
April 5—Dues, Jefferson County .....		.50
April 8—Check No. 107, C. T. Dearing Printing Co.		11.25
To 1 M letterheads.		
April 8—Check No. 106, W. K. Stewart Co.		3.70
To office supplies.		
April 12—Dues		9.50
Taylor County	\$ 8.50	
McCracken County	1.00	
April 15—Contribution to State Treasury		5.00
Donated by McCracken County.		
April 19—Dues, Jefferson County		1.50
April 19—American Medical Association		1.25
To commission on Hygeia.		
April 26—Dues		5.50
Jefferson County	\$ 1.50	
Allen County	4.00	
April 26—American Medical Association		1.25
To commission on Hygeia.		
April 26—Check No. 108, Mrs. Irvin Abell, Treas.		4.25
To American Medical Association Auxiliary dues for 17 Taylor County.		
April 26—Check No. 109, Mrs. Irvin Abell, Treas. ....		.50
To American Medical Association Auxiliary dues for 2 McCracken County.		
May 1—Dues, Garrard County .....		.50
Stamps received for this amount.		
May 1—Dues		4.50
Madison County	\$ 4.00	
Jefferson County .....	.50	
May 9—Contribution to State Treasury		7.00
Donated by Marshall County.		
May 9—Dues, Jefferson County .....		.50
May 11—Dues, Jefferson County		2.50
May 26—Check No. 110, Hoback Printing Co.		3.00
To 300 membership cards.		
May 27—Check No. 111, Mrs. Ed Clay Mitchell		13.00
To Southern Medical Association Auxiliary dues for 13 counties.		
June 2—Dues, Franklin County		3.00
June 5—Check No. 112, Hoback Printing Co.		3.50
To 500 county file cards.		
June 12—Dues		17.00
Breckinridge County	\$ 7.00	
Calloway County	10.00	
June 12—Check No. 113, Mrs. B. H. Parrish, Treas.		3.00
To rebate on dues paid in duplicate.		
June 13—Dues		10.00
Perry County	\$ 3.00	
Graves County	6.50	
McCracken County .....	.50	

June 18—Check No. 114, Mrs. Ed Clay Mitchell.....		6.00
To Southern Medical Association Auxiliary dues for 6 counties.....		
June 18—Dues, Bell County.....	5.50	
June 20—Check No. 116, Mrs. Irvin Abell, Treas.....		22.50
To American Medical Association Auxiliary dues for 88 members.....		
June 24—Stamps, (Those received from Garrard Co.).....		.50
June 24—Dues.....	37.00	
Oldham County.....	\$ 5.00	
Ballard County.....	.50	
Jefferson County.....	8.00	
Madison County.....	3.50	
Harlan County.....	12.50	
Marshall County.....	4.00	
Perry County.....	3.50	
June 24—Check No. 117, Jane Crawford Memorial Fund.....		2.50
To Oldham County donation included in their check for dues and deposited in National Bank of Kentucky.....		
July 3—Check No. 118, Mrs. Ed Clay Mitchell.....		2.00
To Southern Medical Association dues for two counties.....		
July 3—Check No. 119, Mrs. Irvin Abell, Treas.....		13.50
To American Medical Association Auxiliary dues for 53 members, one for two years.....		
July 3—Check No. 120, Mrs. Irvin Abell, Treas.....		.75
To American Medical Association Auxiliary dues for 3 members.....		
July 3—Check No. 121, Mrs. C. H. Jones, Treas.....		5.00
To rebate on dues paid twice.....		
July 3—Check No. 122, Mrs. Harry Jones, Treas.....		2.00
July 5—Dues, Franklin County.....	1.50	
July 5—Check No. 123, Hoback Printing Co.....		3.50
To 500 notices of dues.....		
July 5—Check No. 124, Mrs. W. G. Salisbury.....		1.00
To rebate on dues paid Jefferson County for Gray & Green from personal account.....		
July 5—Check No. 125, Mrs. Irvin Abell.....		.25
To American Medical Association Auxiliary dues for one member.....		
July 5—Check No. 126, Mrs. Irvin Abell.....		.50
To American Medical Association Auxiliary dues for two Franklin County.....		
Total Receipts.....	\$ 412.52	
Total Disbursements.....		222.10
Balance on hand, National Bank of Kentucky.....		190.42
	\$ 412.52	\$412.52

PERMANENT COMMITTEES

President Blackburn authorizes the announcement of the appointment of the following committees:

COMMITTEE ON LEGISLATION AND PUBLIC INSTRUCTION

Dr. Irvin Abell, Louisville, Chairman.
Dr. J. D. Whiteaker, Cannel City.
Dr. Claude Youtsey, Newport.
Dr. J. H. Blackburn, President, Ex officio.
Dr. A. T. McCormack, Secretary, Ex officio

COMMITTEE ON MEDICAL EDUCATION

Dr. W. A. Jenkins, Louisville, Chairman.
Dr. J. W. Scott, Lexington.
Dr. J. G. Gaither, Hopkinsville.

COMMITTEE ON HOSPITAL STANDARDIZATION

Dr. J. Garland Sherrill, Louisville, Chairman.

Dr. J. M. Salmon, Ashland.
Dr. J. B. Northcutt, Covington.
Dr. J. H. Blackburn, President, ex-officio.

COMMITTEE ON CONTROL OF CANCER

Dr. Wallace Frank, Louisville, Chairman.
Dr. J. W. Stephenson, Ashland.
Dr. P. H. Stewart, Paducah.
Dr. H. V. Pennington, London.
Dr. A. W. Davis, Madisonville.

COMMITTEE ON MEDICAL STUDENTS' LOAN FUND

Dr. Granville S. Hanes, President-elect, Chairman.

Dr. David Barrow, Lexington.
Dr. Irvin Abell, Louisville.
Dr. John W. Moore, Louisville.
Dr. R. E. Smith, Henderson.
Dr. E. W. Jackson, Paducah.
Dr. E. S. Moss, Williamsburg.
Dr. L. H. South, Louisville.

President-elect Hanes authorizes the announcement of the appointment of the following committee:

COMMITTEE ON SCIENTIFIC WORK

Dr. Granville S. Hanes, President-elect, Chairman.

Dr. W. E. Gardner, Louisville.
Dr. C. W. Hibbitt, Louisville.
Dr. A. T. McCormack, Louisville.

Mediastinal Emphysema and Air Embolism in the New-Born.—At necropsy on a baby whose cries at birth had been weak and who had breathed superficially during the twelve hours during which it lived, air was found in the left heart, the coronary arteries and the mediastinal tissue. There were numerous hemorrhagic foci in the brain. Kaiser and Schrader explain the child's death and the pathologic change as follows: On the rupture of the membranes, hemorrhage occurred in the child's brain, with injury to the respiratory center. During the forced respiratory movements following birth, the lung tissue was torn, and from this resulted mediastinal emphysema and air embolism.

ORIGINAL ARTICLES

"MANAGEMENT OF UTERINE HEMORRHAGE"*

By I. T. FUGATE, Louisville.

Since the subject of uterine hemorrhage is far too large to be covered, even in the most sketchy way, in a brief paper, perhaps I had better begin by stating what phases I shall touch upon and from what angle I shall approach what remains of the subject.

I wish to consider only such forms of uterine hemorrhage as are suitable for radiation treatment or such unsuitable varieties as require to be differentiated from those which may be expected to yield to x-rays or radium. Obviously then, I shall not consider the hemorrhages directly associated with pregnancy and labor, nor those due to traumatism or associated with general hemorrhagic condition; neither shall I include menstrual anomalies except insofar as they become distinctly pathological and suitable for radiation treatment.

This leaves two major classifications; hemorrhages of benign and of malignant origin, not always so easy to differentiate in the early stages although every effort must be made to distinguish between them as the plan of treatment is so different in the two situations, even though the presenting symptom may be the same in degree and character.

It was Howard Kelly, who won his fame over the operating table, who made the statement that if radium had no other use than in the treatment of the benign uterine hemorrhage due to changes in the endometrium, it would still be the greatest therapeutic agent known to gynecology. This does not pretend to be an exact quotation but it conveys the essence of Dr. Kelley's oft quoted dictum. This type of hemorrhage is, indeed, remarkable in its uniform and satisfactory response to proper application of radium. This is the type appearing most often at or about the menopause characterized by profuse metrorrhagia or at first menorrhagia and with no other symptoms except secondary anemia and its attendant complications. On vaginal examination the cervix presents no other abnormality than perhaps the scars incident to child-bearing; the mucosa is apt to be pale if the hemorrhage has continued long and been profuse; the cervix will probably be somewhat relaxed and boggy; the uterus itself has a flabby texture but is without irregularities suggestive of tumor formation. Otherwise, pelvic examination is, in the typical and suitable case, negative. I phrase it in this way

because the presence of evidence of old pelvic infection has a very definite bearing on possible radiation treatment, a phase which I shall cover in some detail a little later as it applies to all the indications for which pelvic radiation may be administered.

Cases such as those described may be expected to yield 100 per cent of cures following radium applications. It is occasionally necessary to make a second application but even this is rare, as the first treatment, if properly administered, is almost certain to result in permanent relief. With an individual near the menopause, there is no fear of upsetting the endocrine balance by too much depression of ovarian function. It is time for the menses to cease anyway and indeed the benefit to be derived from the treatment is quite as much due to radium action on the ovaries as to its action on the endometrium itself.

The question always arises in these cases whether a preliminary curettage should be done. A curettage is not at all necessary to enhance the radium results in true hemorrhagic endometritis or metropathy as some authors prefer to term the condition. It is, however, held by many surgeons, especially, to be a desirable preliminary in order to eliminate through microscopic examination of the scrapings the possibility of a malignancy of the fundus. This, we believe, to be a wise precaution especially in patients in the fourth decade although I believe it justifiable to omit it where the history is perfectly typical and thorough pelvic examination reveals no evidence whatever of any infiltration of the fundus.

Occasionally, this type of hemorrhage occurs in a young woman and the radio-therapist is then faced with a somewhat more delicate dosage problem since it is desirable to abate the hemorrhage without permanently destroying the specific sex function of the ovaries. This can be done although the treatment must be gone at somewhat more cautiously than with patients at the menopause and consequently there is greater likelihood of a second or even a third dose being required. Properly judged radium treatment will, however, abolish the menses for a period of six to twelve months after which the function will return probably without the abnormal hemorrhagic feature.

It is also frequently possible, as has been discovered within the last few years, to abate idiopathic uterine hemorrhage in young women by means of x-ray treatments directed toward the spleen in a large percentage of instances. A rather moderate radiation over the spleen in these cases has the effect of shortening the coagulation time very materially probably through an effect on the blood platelets and this effect is taken advantage of

*Read before the Cumberland Valley Medical Society.

where the presence of inflammatory conditions in the pelvis render it unwise or inadvisable to introduce radium into the uterine canal. X-radiation over the spleen is also sometimes used as an adjuvant to intra-uterine radium where it is desired to secure a very prompt effect on severe or dangerous hemorrhage from any cause.

A somewhat commoner cause of benign hemorrhage and one which is also, in many instances, suitable for radiation treatment is uterine fibroid. Let us say briefly that sub-mucous fibroids, pedunculated fibroids, fibroids which are so large that the upper border extends above the umbilicus, fibroids which are complicated by old pelvic infection and those which are suspected of undergoing malignant degeneration are generally considered unsuitable for radiological treatment. This leaves, however, an enormous number of small to fairly large intra-mural or sub-peritoneal growths uncomplicated by old infection which yields truly amazing results to proper radiological treatment and it should be emphasized that approximately the same results may be achieved in these cases with either x-ray or radium. The radium action is somewhat more prompt, or at least the number of treatments required is apt to be considerably less. The end results are about the same and in making a choice the entire background and history must be gone into in order to choose that agent which is best suited to the particular pathological condition as well as the economic and geographical situation of the patient. For instance, we prefer to treat with radium patients who come from a distance and would therefore find it impossible or inconvenient to return for x-ray treatment every two or three weeks. We prefer to use radium in patients with severe hemorrhage as its action is somewhat more prompt especially in checking the hemorrhage. We prefer to use radium in fibroids with unusually firm, solid texture as it appears that the direct action of the radium reduces these somewhat more promptly and completely than does the x-ray.

In spite of the contra-indications mentioned, radium treatment often gives very surprising results even in large fibroids. We recall particularly one patient, the upper limit of whose growth extended some three fingers breadth above the umbilicus. She had utterly refused to go to a surgeon and we believe was referred for radium treatment by her physician simply as the only means of convincing her that her tumor would not improve under such handling. We ourselves, tried to refer her to a surgeon as we felt that the growth was too large to give a satisfactory prognosis. Meeting again with refusal, however, we made a twenty-four radium application with some

misgivings and instructed her to report for observation in two months. The upper limit of the growth at that time was still definable but instead of being some two or three fingers breadth above the umbilicus bore about that relation to the symphysis. When she came back a month later, nothing could be palpated above the symphysis and pelvic examination showed that the entire growth had decreased to about the size of a small orange. She was quite free from symptoms, was riding, swimming, and playing golf and naturally was not interested in any surgical treatment for what remained of her condition. I do not, by any means, mean to imply that all of these big fibroids yield in this way to radium treatment. If they did, we would not list mere size as a contra-indication. However, size alone does not deter me from administering treatment in the case of a large fibroid of fairly soft and even texture if the patient is for any reason opposed to surgical intervention. In fact, it is my belief that if physicians generally knew just how efficacious the radium treatment of those conditions can be, relatively few of them would be treated surgically. There is with radiation no immediate mortality; there is no long period of convalescence. The hospitalization period amounts to two or three days only and the functional result in properly selected cases is at least as good as the functional result following surgery although, of course, some traces of the tumor can usually be discovered by careful palpation.

Passing from benign to malignant cases of uterine hemorrhage, I shall not attempt to consider any but the common type of uterine malignancy, i. e. carcinoma originating either in the fundus or in the cervix. Carcinoma of the fundus is relatively rare and yields such good results following early and adequate surgical intervention that we on the radiological side prefer not to treat it except where there are some definite contraindications to a major operation. It should be said, however, that where operation is for any reason impossible, malignancy of the fundus can be palliated and not infrequently permanently relieved by adequate radiation therapy.

Turning to the much commoner carcinoma of the cervix, it is now universally admitted that proper radiation treatment gives better results than surgical treatment in all the so-called operable stages of this disease, as for instance, the extremely early growths which are strictly limited to the cervix and in which the five year cures should constitute practically 100 per cent of the cases treated whether the treatment be hysterectomy or adequate radiotherapy. The unfortunate thing, of course, is that neither the radiologist nor the surgeon sees any considerable number of cer-

vical malignancies in this stage. This fact is very depressing to contemplate but it is perfectly natural and I doubt if the situation will ever be materially improved in that direction as such early malignancies are practically symptomless and are not apt to be discovered except accidentally during careful routine examination undertaken for some other reason.

The acceptance of radiation treatment in cervical malignancies is one of the most striking things in the literature of radiology in the past few years. A form of treatment which only a few years ago was decried by men as prominent as Deaver and condemned as being far worse than useless, is now accepted in preference to surgery by almost every outstanding gynecologist and general surgeon not only in this country, but throughout Europe.

The possibility of cure in a given case of cervical malignancy depends as we now see it upon the extent of the growth and the degree to which it has infiltrated the surrounding tissues or metastasized into neighboring lymphatic areas; the radio-susceptibility of the particular type of malignancy present, a field which we are just beginning to explore, and the manner in which treatment is administered.

I have made repeated reference to "proper" and "well-judged" radiological treatment. These qualifying terms have been employed because, contrary to what I feel is the popular impression, an understanding of the underlying pathology and of what one may term the pathological physiology of cancer are quite as important to the radiologist in planning his treatment as to the surgeon in mapping out an operative procedure. Further, there is the same need for adaptability to different conditions; there is the same need for a highly developed technique and there is the same probability of securing remarkably good or distressingly bad results simply through variations in the technique of procedure. I think it is not too much to say that there is far more opportunity and indeed need for variations in technique to suit existing conditions in the uterine application of radium than there is in a hysterectomy. This need for a refined and well developed technique has been well expressed by Douglas Quick in his statement that it is the last 10 per cent of a dose of radium or x-ray which cures cancer. Therefore, inadequate applications made in such a way that the malignant tissues receive only a retarding dose of radiation should be employed when it is realized that there is no hope of cure and that palliation only can be expected. In such instances, the patient's comfort is the first consideration and the dosage will be designedly small.

Where the extent and stage of the growth,

however, makes cure seem possible, calculations must be made to insure that every part of the growth receives a truly adequate dosage of radiation. These calculations require consideration of the size of the patient, the percentage of the dose which is delivered at a given distance from the radium applicator or x-ray tube, the avoidance of permanent injury to uninvolved tissues, the general condition of the patient as it relates to ability to withstand a heavy depressing dosage of radiation, and the patient's individual reaction to treatment which may require complete reconstruction of the therapeutic program after it has been instituted.

Intra-uterine application of radium alone is by no means sufficient to offer the best chance of cure even in small and early cervical malignancies. There must be, in addition, application of radium outside the cervix to the fornices and there should be in practically all instances external radio-therapy over the entire pelvis with x-rays of a wave length on the order of those produced by 200 K. V. This is true because radium intensity decreases so rapidly as the tissues under treatment become remote from the applicator that it is impossible to give an adequate dose of radium to the parametrium through the medium of an intra-uterine application without causing undue destruction of uterine tissues.

The program in the relatively early case then is to give an intra-uterine dose with the object of taking care of the purely local growth. If one could be positive that this did not extend beyond the inner half of the cervix, this dose would constitute the entire treatment. However, inasmuch as one can never be sure of this fact and in fact, is almost always sure that this is not the case, the second part of the treatment consists in a radium application to the fornices just below and lateral to the cervix. These two applications will ordinarily bring the radium effect up to the limit of tolerance of the bladder and rectal tissues which it is impossible to avoid treating to some extent even though every effort is made to block them off as far as possible from the radium container. However, the total dosage of radiation will still fall somewhat under the amount required to destroy the carcinoma cells and the dosage must be made up by administering x-rays over the entire pelvis of such penetration that some 40 per cent of the dose given over any skin area will reach the depths of the pelvis. By combining the two agents in such fashion and only by so doing can the entire pelvis be adequately irradiated.

Employing such methods various institutions which owing to the nature of their clinical material and the completeness of their fol-

low-up system are able to keep accurate track of their results report five year cures in favorable cases of carcinoma of the cervix ranging as high as approximately 50 per cent of cases treated. These statistics are constantly showing an improvement owing to slight changes made from time to time in the technique permitting more thorough radiation of the pelvic structures without undue damage to uninvolved parts.

Presumably, private statistics, if available would be similar to those from such institutions as the Memorial Hospital in New York and the Radium Institute in Stockholm.

Unfortunately, many or indeed most of the cases of cervical malignancy seen by the radiologist are so far advanced that nothing more than palliation can be hoped for. Those are the cases classed by the surgeon as inoperable and which show wide infiltration of the parametrium and possible fixation of the uterus. With such patients, treatment should be sufficient to produce the maximum of palliation but not sufficient to cause a great deal of post-treatment distress or to risk the formation of fistulae or other disastrous after effects of ill-judged radiotherapy. In any case suitable for treatment at all, one should be able to promise at least a temporary cessation of the hemorrhage, abolition or marked diminution of the foul discharge and reduction of the toxemia. Pain, if present, should be relieved following treatment. There should be a prospect of conferring at least a year of relatively comfortable existence on the patient if palliation is to be undertaken at all. Inasmuch as the limitations of radiological treatment as well as its capabilities are naturally best understood by men who are in constant touch with it, it is not surprising that we find it necessary to refuse treatment in many cases referred too late for even satisfactory palliation.

Finally, it is well to discuss freely some of the undesirable by-effects of pelvic radiation, the causes for them, and means by which they may be prevented. I have already referred to old pelvic infection as a contraindication to pelvic radium treatment. The presence of an old tube or indications of old pelvic peritonitis, no matter if these have been quiescent for years constitutes a decidedly serious risk if pelvic treatment with radium is to be undertaken. The radium action seems to have the unfortunate ability to stir up these old infectious processes and produces a tremendous and dangerous and in some cases even fatal lighting up of the infection. Consequently, it is essential that a good history and a thorough pelvic examination precede pelvic irradiation. Any one should step very lightly indeed in the presence of indications suggestive of old inflammatory disturbance.

A second occasional misfortune subsequent to pelvic irradiation is the formation of vesico-vaginal or recto-vaginal fistula. This is a most unfortunate occurrence because even if the patient is cured of her cancer she suffers an amount of subsequent distress only slightly less grave. It is a peculiar fact that while the uterus is the most resistant of all bodily tissues to the effects of radiation the rectum and the bladder are among the most sensitive. Fistula formation can be avoided by careful calculation of the total dosage, keeping it within safe limits. As it is necessary, however, to administer a dose very close to the danger point, if results are to be secured, the real precaution lies rather in the manner of administration than in the total dosage. The rectal and vesical walls are separated as far as possible from the radium applicator by packing the vagina very thoroughly and very fully during the periods of treatment. The crossfiring between the x-ray and radium doses is so arranged that the cervix and parametrium get the maximum dose and the bladder and rectum get the minimum dose. Thirdly and probably most important no case is treated with heavy dosage which shows any beginning infiltration in the direction of the rectum or bladder. It seems probably that most cases where fairly well judged applications of radium have resulted in fistulae were cases which should not have received heavy doses at all as there was probably already a cancerous infiltration in the region in which the fistula later occurred which would of itself have resulted in fistula had no treatment been given. When one recalls that the basis of all radiation treatment of cancer lies in the fact that cancer cells are more easily destroyed by radium or x-radiation than are normal cells, this theory will be seen to be extremely reasonable.

The general disturbance so frequently caused by x-ray and occasionally by radium is, in some ways, perhaps the most unfortunate minor complication of radio-therapy in pelvic conditions since there is so little one can do to prevent or control it. The degree and character of this reaction depends only in part on the severity of the dose, being very largely a factor of the individual chemistry of the patient. In fact, under exactly similar circumstances as to dosage, treatment and so forth, one patient may experience only a slight nausea which scarcely interferes with her meals while the next may be profoundly nauseated and depressed for several days and may even have a rather severe secondary anemia and develop a state of exhaustion lasting for a few weeks and apparently due to the treatment alone. In our personal struggle with this problem we feel that we have improved our results quite materially during the

past few years by a number of minor measures, varying from ventilation of the treatment rooms to restrictions in diet. The installation of a cylindrical metal container for our x-ray treatment tube coupled with very free ventilation of the treatment chamber has certainly helped a great deal especially in decreasing x-ray sickness during the series of treatments. The omission of meats and other foods of high protein content from the diet has apparently been helpful and the addition of orange juice and alkalis during the treatment period and for a few days before and after has also seemed to be of some benefit. In some few instances, hypodermics of codein administered just before treatment have controlled the nausea which occasionally patients with what amounted to an idiosyncrasy to x-rays tended to experience during the seance.

Fortunately, these phenomena are associated chiefly with x-ray treatment and only to a very mild extent with radium treatment.

To summarize briefly the results that may be expected from adequate radiological treatment in suitable cases of uterine hemorrhage the simple cases of benign hemorrhage due to hemorrhagic endometritis are almost uniformly permanently relieved by one or at most two applications of radium. Suitable cases of fibroid of the uterus, which is to say, those that are not too large, those which are not submucous, not pedunculated, not undergoing malignant degeneration and not accompanied by old inflammatory disturbances, which classifications, however, includes probably 75 per cent of fibroids, can be relieved in a very high percentage of cases so completely as not to require any further treatment, by either x-ray or radium whichever agent the radiologist may choose for the individual case. Cancer of the cervix yields definitely better results to radiotherapy than to any other form of treatment and in favorable cases the percentage of cures approximates 50 per cent. Many cases of this disease which are obviously incurable may be palliated in such a way as to give the patient a year or more of comfortable and worthwhile existence which she would not otherwise have had.

As in the case with other therapeutic methods the results within given limits achieved by any individual worker with these agents will depend very largely on the care with which he studies his cases and the skill with which he uses his therapeutic agents.

THE SPECIALIST AND GENERAL PRACTITIONER*

By W. S. KINSOLVING, Eddyville.

There are a good many departments and branches in the science and art of preventing and curing disease, and it would be hard to do away with any one of them. But we want to speak more especially on the work of the specialist and his relation to the general practitioner, and their mutual relation and dependence upon each other. The general practitioner can not get along without the specialist, and the specialist can not do without the general practitioner. They must work together hand in hand and heart to heart in perfect harmony and unity for the greatest achievements.

The specialist should have a thorough common school education, for this is the foundation of all learning; then a practical high school education, with special attention to the branches that directly aid in his profession. And then he needs to go to a medical college and study like a Trojan, and be taught and trained under a faculty of competent practicing physicians in general medicine. After twenty-four to thirty-six months hard study, he needs to be examined strictly and thoroughly by this faculty of broadminded, practical general practitioners, when, if he be found competent, let him be given a diploma, with the degree of M. D. Next, he should spend at least five years in active general practice, and obtain a general knowledge of the practice of medicine, thus laying the foundation for a successful specialist. Then if he desires to become a specialist, let him take a special post-graduate course in the specialty of his choice, and let him thoroughly prepare himself by as long a term of study and training as is necessary.

No doctor should be allowed to practice as a specialist without the proper previous experience as a general practitioner, so he may not get the one idea in his head and think that almost all ailments must be treated in his special line of practice. He must be broadminded, not narrow, in his diagnosis. For instance, if he is a surgeon, he must not get the idea in his head that everybody that has a pain in the right side of the abdomen has appendicitis and must have a surgical operation.

The general practitioner does not need to be a specialist or research worker. It is not practicable or possible to make specialists and research workers out of all doctors.

The general practitioner needs a thorough common school education and a practical high school education, then twenty-four to thirty-

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six months hard study and training on all the common and general diseases. He will then be competent to treat ninety per cent of all the ailments of mankind; and when any condition occurs that he needs a specialist, he can call one in the case.

We general practitioners do not need to be dentists and do all skillful and intricate operations upon the mouth and teeth. We do not need to be expert chemists and bacteriologists and microscopists and radiologists to be expert doctors wholly and perfectly competent in our line of practice. No one can grasp the whole field of medical science and be proficient in all its branches. Life is too short and we can not afford to spend the most of our lives in trying to learn the whole field of medical science and all of us be specialists and research workers. This is a monstrous absurdity. Yet the A. M. A. and the medical colleges are trying to make all doctors specialists and do away with the general practitioner. It is said that most of the teachers in the medical schools are ultra-theoretical and scientific bookworms, and never do any actual practice, and know as much about practical medicine as Braddock knew about fighting the Indians. Braddock had read of the Indians, and he was an ultra-scientific British general, but he had no practical experience in fighting Indians, and he led his army into a horrible destruction, terminated his career in sorrow and shame.

So this unreasonable medical practice law and these ultra-theoretical medical teachers are keeping medical students in school half of their useful lives learning so many non-essentials to the general practical man, and are turning a horde of theoretical specialists loose on the cities, with no general practitioners for the small towns and the country; and in this way they fill the cities with more specialists than can make a living, and leave the small towns and the country in dire distress because they have no doctors.

This is a tragic calamity that is widespread all over the United States and is growing and increasing every year as the general practitioners are dying off; and if this nefarious law is not modified, the people will rise in their might, assert their rights, elect men to the legislatures that will abolish this odious, tyrannical law, and dispel so much dissatisfaction, sorrow, misery and death that is abroad all over the country districts.

"Ah!" says one, let the country people go to the hospitals in the cities and get better treatment than in the country. This is certainly very absurd and impracticable. Very few would be able to pay their way in a city hospital, and not many would want to leave home if they were financially able, and we all know that most of us want to be in our own

homes when sick. I would rather be at home when sick and have a good country doctor to treat me than be in the most gorgeous hospital in the world. Don't we all know when any one is bad sick away from home they are moaning and wailing to get home? Haven't we all heard the dying moans of the patient dying away from home, "I want to go home," "I want to go home"? And the last word they utter, they say, "I want to go home."

Some writers in the medical journals speak very disparagingly of the general practitioner. They seem to think he is fast passing away before the rapid strides of the specialist. They seem to think that the progress of the surgeon and specialist has been so rapid and glorious that the general practitioner is lost in the glare of the flashing steel. And the medical colleges are not trying to turn out general practitioners, but specialists, surgeons and research workers. This is certainly very absurd because it has been proven that the majority of diseases and ailments are best treated by the general practitioner. Oschner, the great surgeon of Chicago, says 90% of all the ailments of mankind are best treated by the general practitioner. We need the surgeons and specialists in only about 10% of all the afflictions.

But understand that we are not speaking in any disrespect of the surgeons and the specialists. The work that they have done and are doing is grand and glorious, and no honor and fame is too great to be conferred upon them, but we don't want all the profession to be specialists. We want 90% of the doctors to be general practitioners and 10% to be specialists, so the people can be properly taken care of and stop all this calamity of woe and misery that is all over the country districts and is growing worse every year.

Yes, we need the specialist and we need the general practitioner, and we can not do without either of them. The general practitioner needs the specialist and the specialist needs the general practitioner, and the people need both. All the departments of science and art in all their ramifications must work together in glorious harmony for the peace, health and happiness of the people.

Surgeons and other specialists that limit their practice to surgery or one, two or three kinds of ailments can not make a living in the country or small towns; and if all the doctors or the most of the doctors are going to be specialists, it is plain to be seen that all the small towns and country districts will be without doctors and the cities will be overrun with all kinds of surgeons and other kinds of specialists. The rural districts will be infested with all kinds of quacks and illegal doctors, because if the people can not get good legal doctors they will have to take

some kind of pretender that claims to know more than the general run of people. The progress and happiness of the rural people would be destroyed, the cities would be weakened, by the great calamity of the country districts, and there would be universal confusion, misery and woe, both in the country and the cities throughout the State and nation.

Some writers in the medical journals seem to think that most of the people in the world don't like to live in the country and that all the girls and boys that graduate in the colleges in the cities will not go back to the country and the small towns to live in the future. That is a great mistake. Hundreds of the people in the cities would not live in the cities if they could move their business to the country. I know people who work in the city and go twelve and fifteen miles out in the country suburbs to sleep at night to get that sweet and satisfying rest that comes to one in the country away from the confusion, rumble and turmoil of the city. A great many famous people of the cities like to live in the country. Yes, thousands and millions of people love to live in the country and would not live in cities. Hundreds of bright young men living in the country would like to make doctors and be general practitioners in the country and small towns, but it is impossible for them to do so on account of this medical practice law being so monopolistic, autocratic, tyrannical and prohibitive.

What is the remedy for all this evil? Revise the medical practice law, and don't be arbitrary and unreasonable, but use common sense, reason and good judgment. Shorten the term for graduation and confer the diploma for M. D. upon knowledge, merit, mental and moral worth, and fitness to make a good general practitioner; and not upon the arbitrary time of six or seven years in medical college. We all know that a great many students will be better fitted and qualified in two years than others will be in six or seven years. Then, confer the title of M. D. upon merit and knowledge, and not upon the time in college.

We believe that all intelligent young men and women with a good high school education, and industrious, studious and ambitious, can, in twenty-four months, get enough theory and knowledge of general medicine; and then with practice and experience, they will make better general practitioners than most of those that stay in college seven years and try to master the whole field of medical science.

Shorten the time for general practitioners to twenty-four months, and if they can pass the test of a thorough practical examination, and if they are found competent and mentally and morally worthy, confer the title of M. D.,

and then let them practice at least five years in general practice; and then all that desire to make specialists, let them take post-graduate work and prepare themselves thoroughly for the specialty of their choice. In this way we would have plenty of general practitioners and enough specialists to take care of the people, and the poor boys and girls in the country would be able to study and practice medicine, and we would have plenty of good doctors in all the small towns and country districts and better specialists in the cities; and all this tragic distress that is abroad over the country would be relieved and the people would be contented and happy.

THE MANAGEMENT OF A CASE OF COMMUNICABLE DISEASE*

By ALBERT STEWART, Georgetown.

Duties of a Health Officer: The law charges a health officer with the duty of protecting the public against communicable diseases. A former interpretation of the duty was that it meant principally the maintenance of a forcible quarantine of well defined cases. It is now interpreted to include the diagnosis of suspicious cases, the discovery and control of contacts, and giving expert advice regarding the treatment of the sufferers. Diagnosis and treatment are often considered to be exclusive rights and prerogatives of family physicians. But many sick persons do not call physicians and many physicians are unable to give their patients the benefits of the best methods of treatment without the assistance of the health department. It is the duty of the health officer to assist the family physician in the diagnosis and treatment of infectious diseases. The jealousies and disputes which frequently arise between health officers and family physicians might be avoided if every health officer had the knowledge and skill which entitle him to recognition as a specialist in communicable diseases and in other lines of public health work.

Discovery of Cases: A health officer learns of the existence of cases of communicable disease in three ways: 1, by the reports of physicians; 2, by the reports of laymen, including teachers, parents and other persons in authority; 3, by means of his own investigations. 1. The laws of the state require physicians to report cases of communicable diseases to which they are called. Some physicians interpret the laws to mean that they shall report only those cases in which they are sure of a diagnosis. But many cases cannot be surely recognized until laboratory tests

*Read before the Conference of County and City Health Officers.

are made or until the disease is fully developed. Physicians frequently delay their reports for some days during the early stages of a disease when it is most infectious; or else, in mild cases, they delay until the symptoms subside and a diagnosis is impossible. The intent of the law is that a physician shall report every case as soon as he has a well-grounded reason to think that it may be one of a communicable disease.

The health officer is usually the official diagnostician of the local health organization, and the family physician has a right to demand that he assume some of the responsibility of diagnosis. If the health officer is not an expert, the best way to compel him either to become one or to resign his office is for family physicians to insist that he assume his share of the responsibility in the diagnosis of every reported case. This means that the health officer must see and examine every case of the more important diseases. If he does this, he will not only aid the physicians, but he will also be able to obtain a full knowledge of conditions in the home, and to adopt measures that will most effectively protect the public, and at the same time will be least irksome to the members of the afflicted family. If the health officer makes no comment unfavorable to the family physician, but discusses the case freely with him in private, there will be little opposition to his visits.

Physicians often refuse or neglect to report cases because they wish to protect the family from annoyance. They argue that the first duty of a physician is to promote the comfort and peace of mind of the persons who employ them. Some physicians seem to think that their only duty is to their employers. But every physician owes a duty to the state which gives him a monopoly of the practice of medicine. The people look to private physicians for protection against pestilences.

2. A second method of discovering cases is by following up reports that come to the health officer from teachers, nurses, parents, and others than physicians. There are great numbers of mild cases to which no physicians are called. These missed cases are the means by which communicable diseases are usually spread through communities of intelligent people, for the severe cases are in bed and do not mingle with other persons.

Some persons deliberately neglect to call a doctor to mild cases of contagious disease because they fear that they will be quarantined. Drastic methods of quarantine may promote this feeling, but the fear of the health officer is disappearing with the institution of rational procedures of isolation, and with the spread of popular knowledge of the dangers which come from neglected mild cases of communicable disease.

Common gossip and rumors are prolific sources of information regarding the existence of cases of communicable disease. A health officer neglects his duty if he fails to follow up these rumors. He will find it extremely embarrassing later to deal with an epidemic whose source is a neglected case, which was known to everybody, except himself.

3. Health officers must often make systematic investigations to discover unsuspected cases of communicable disease, especially during epidemics. The importance of mild and walking cases of infectious diseases is becoming more and more recognized. The refinements of modern diagnostic methods and tests render possible the early detection of nearly every case.

One of the most efficient agents in the discovery of mild cases is the public health nurse. Her information may be obtained through the schools or by house to house visitations. She will often obtain information from neighbors when members of afflicted families try to conceal cases. Her tact and persistence will enable her to secure information where the health officer would perhaps fail.

When an epidemic occurs in a community, it is a great problem for the health officer to discover the living persons who are spreading the germs of the disease. These disease spreaders are usually either persons who have had the disease in a mild, unrecognized form, or who are carriers of the germs. It is important that a health officer should be familiar with the signs of mild cases and of those which have apparently recovered in order that he may recognize and control them.

Means of Diagnosis: It is the duty of a health officer to secure a diagnosis of every suspected case of communicable disease, for the final decision rests with him. If he cannot make the diagnosis, he must know where and how he can have it done promptly and accurately. The diagnosis of the family physician will be accepted in most cases, but if he and the health officer cannot agree, they can prevent ill feeling and promote satisfaction and co-operation by leaving the decision to a third physician in whom both have confidence, or they can appeal to a member of the staff of the State Department of Health.

The diagnosis of many communicable diseases is made with certainty only by means of laboratory tests. A health officer is not expected to be able to perform the tests, but he is expected to know how to secure the material on which the tests are made, and where to send the specimens. The State Board supplies the health officers with outfits for taking material for tests in about a dozen diseases, and especially in diphtheria, typhoid fever, and tuberculosis. The procedures for

taking the specimens are simple, and a health officer has no excuse for failing to make full use of the laboratory for obtaining diagnoses.

Preventive Measures: After a case of communicable disease has been discovered and diagnosed, the next duty of a health officer is to prevent the disease from spreading to other persons. The American principle of personal independence does not allow a health officer to compel the observance of measures to prevent the spread of a disease through the family of the sick person; but laws and customs prescribe that he shall prevent its spread outside the family. The preventive measures to include: 1, the control of the sick; 2, the discovery and control of contacts; 3, the disposal of infectious material that comes from the sick person; and 4, the disinfection of rooms, furniture, clothing, and other things that are used by the sick.

Control of the Sick: Since the source of the germs of human diseases is the body of a sick person, the most obvious measure for preventing the spread of a disease is to restrain the liberties of the sick, and to keep them away from other persons. The restrictive measures arranged in the order of their degree of restraint of liberty are: 1, hospitalization; 2, quarantine; 3, isolation; 4, modified isolation; 5, special restrictions.

Quarantine: The greatest degree of home control and restraint is the quarantine. It requires that the patient and all those living in the house or apartments with the sick person shall remain on the premises, and that all other persons, except the physician and nurses, shall be excluded. It is directed not only against the sick person, but also against the well members of the family who happen to be at home, and against the house and premises. The method of control by a strict quarantine is crude and often cruel, and is usually unnecessary. Yet it may be efficient and is the simplest and easiest of all the methods of control. It is the method of brute force, and would be naturally adopted by a health officer who is ignorant and lazy, for all that he needs to do is to post a policeman at the premises, and to give an order on a storekeeper to supply the necessities of life to the imprisoned household. Still this form of a strict quarantine is often necessary when the members of the family are rebellious and refuse to follow the directions of the health officer. It may also be necessary in controlling where causes are not definitely known. The list of diseases in which strict quarantine may be necessary includes smallpox, typhus fever, yellow fever, plague, and cholera.

Isolation: Another method of separating the sick from other persons is called isolation.

It requires (1) that the sick person and the nurse shall remain in a room that is separate from the rest of the house; (2) that no other person, except the medical attendant and nurse shall enter the room and (3) that everything which leaves the sick room shall be properly cleansed and made free from disease germs. It is a quarantine of the sick person in his room while the adult members of the household who are well are allowed their freedom, provided they do not handle food or come in close contact with children. This method of controlling an infected person requires that the members of the isolated family have a considerable degree of intelligence and reliability, and are willing to follow directions. If the people are uncleanly or unreliable, the health officer will have to give them the choice of obeying his instructions or of submitting to a strict quarantine of the house and all the members of the family.

If isolation is imposed on a person who has a communicable disease, the health officer must tell the family what to do and what not to do. He must visit the home more than once, for few persons will remember or grasp all the directions which he will give unless he repeats or demonstrates them. It is the duty of the family physician also to give these directions, but the health officer is responsible that they are carried out, and he must see that the household receives them. Many sick persons have a physician only once or twice, and in these cases it is certainly the duty of the health officer to see that the directions are carried out.

The list of diseases in which the method of control by isolation of the sick may be followed includes scarlet fever, diphtheria, cerebrospinal meningitis, septic sore throat, and measles.

Special Restrictions: Some diseases are not likely to spread unless the sick come into close association with well persons or their fresh excretions, as by sleeping in the same bed, using the same toilet utensils, or eating from the same spoon. A person sick with one of these diseases may be allowed to mingle with other members of the household, or with the public, provided the special rules which are necessary for that disease are followed. Tuberculosis is an example of a disease in which freedom in most respects may be allowed to a patient provided that special precautions adapted to the individual are observed.

Discovery and Control of Contacts: Persons who have not had a disease and have been closely associated with a case are called contacts, and are to be considered as in danger of coming down with the disease. It is the duty of the health officer to discover

these persons and to inform them of the possibility of their having contracted the disease, and to keep them under observation during the period of its incubation. If they have left town, it is his duty to inform the health officials of the municipality to which they have gone. The health officer must be the judge of the likelihood of their being infected and of the degree of restriction that must be imposed on them.

Those who have been in close contact with a case of communicable disease and have not taken the precautions to cleanse their hands and clothing, may carry disease germs on their persons, although this danger is not nearly so great as was formerly supposed.

Special precautions are taken with children living in the house with an isolated person because (1) they are much more susceptible to most diseases than adults, and (2) they do not have sufficient knowledge and experience to carry the health officer's directions of their own accord. Well children who are contacts and who have not had the disease, must be held under some degree of isolation and control during the period of its incubation in order to be sure that they do not come in contact with others if they come down with the disease. They may be allowed to go to the house of a relative or friend where there are no children, provided they are isolated there. Child contacts who have had the disease may be permitted to have their freedom, provided (1) that they take a full bath; (2) that they put on clean clothes, and (3) that they leave the premises of the sick person and remain away during the whole period of isolation.

Disposal of Excretions: Nearly all the germs that escape from the bodies of sick persons will be found in their discharges and excretions. Anything that is soiled by them may also contain the germs. The principal discharges and excretions which require attention are those from the nose and mouth, those from the intestine and bladder, and those from sores on the skin. The breath is free from disease germs except when it bears tiny drops of saliva or mucus which are expelled by violent acts of breathing, such as coughing or loud talking. The vapors that pass off from the skin do not contain disease germs. The touch of an unbroken skin cannot cause a disease unless the skin is dirty and soiled with the excretions of the body.

A simple method of disposing of the discharges from the nose and throat is to receive them upon paper napkins or rags which are to be burned; or upon handkerchiefs which are to be boiled and then washed. Warn the sick persons and their attendants against spitting on the floor or walls or anywhere else than into containers for the sputum.

A simple method of disposing of the dis-

charges from the bowels and bladder is to bury them at once in the back yards. Dig a hole about two feet square and deep. Empty the discharges into it and cover them with a few inches of soil. Such a hole may be used for several days until it is nearly full. Do not empty the discharges into an ordinary water-closet unless it has an underground vault which is tightly closed against flies and vermin. It is usually safe to empty the discharges into a public sewer or into a cesspool that is properly located and covered. Scald the vessel with boiling water after emptying it.

Heat—is the most reliable and efficient disinfecting agent that we have. It is also one of the cheapest and most easy to apply. A boiling temperature, 212 degrees F., will kill most disease germs in a few seconds. If only a small quantity of boiling water is poured over articles, the water will be cooled and the temperature of the disease germs will be cooled and the temperature of the disease germs will be much lower than that of boiling. A temperature of at least 140 degrees F., is needed to kill ordinary disease germs. The highest temperature which a person can usually endure with the hands is only 120 degrees F. A safe order which a health officer may give is to direct that dishes, towels, handkerchiefs and bed-clothes, and all other articles in common use shall be boiled before they are washed. After they have been boiled, they will be free from disease germs, and may be put with the household articles that are used by the other members of the family. A good method of applying heat is to keep a large kettle of hot water boiling on the kitchen stove, and to place in it all small articles such as knives, forks, dishes, and napkins, as soon as they are taken from the sick room. Laundry articles may be placed in a wash-boiler in the sick room, and then boiled at once on the kitchen stove.

Terminal Disinfection: If the proper care is taken continuously during the course of a sickness, there will be no disease germs left in the sick room at the end of the disease. But in order to make sure that all the disease germs have been destroyed, a health officer will require that the room and its contents shall be disinfected before the sick person is released. There are three common methods of disinfection: First, a thorough house-cleaning; second, scrubbing with disinfectant; and third, fumigation with a disinfectant. A health officer seldom has the facilities for doing a thorough fumigation; and if it is not thoroughly done it leads to a false idea of security. But a health officer can always get a thorough house-cleaning done, and can have a disinfectant added to the water which is used. A liquid disinfectant

rubbed upon the floors and furniture is far more effective than a gaseous one blown upon them.

Personality of the Health Officer: A quarantine or isolation usually requires that the ordinary home life be upset. The details of the isolation will often depend on the arrangements which the health officer and attending physician can make with the family. Each case must be judged by itself and due consideration must be given to the character, personal habits, occupation, and financial means of the wage-earners. Imposing an isolation or quarantine requires tact, diplomacy, and good judgment on the part of the health officer. If he is imperious in his manner and loud voiced in his talk, he is sure to arouse antagonism, and to encourage the concealment of cases and the evasion of restrictions. He must be willing to devote a considerable time to educating those who are subjected to his orders, and to take the trouble to explain the reasons for the particular restrictions which he imposes.

SYPHILIS: THE UNDERLYING CAUSATIVE FACTOR IN DENUDATION OF MUCOSA. REPORT OF A CASE*

By LEON L. SOLOMON, M. D., Louisville.

The part played by syphilis as an underlying factor in the production of skin manifestations—in particular, the sluggish, destructive ulcerative type—is too well known to be more than passingly referred to in a case report or in a brief medical summary. Similarly, syphilis is known to be prone to lower cell vitality in mucous surfaces, thereby predisposing to denudation and ulcer formation.

Both the physician and the surgeon will do well to bear in mind the tendency of syphilis to play an indirect, if not the sole etiological role in gastric and in intestinal ulceration. I am convinced that, in not a few instances, recourse is had to surgery, where the patient would have recovered, had the cause been removed by a thorough course of anti-luetic medication.

In a recent discussion with a colleague, I was reminded that, though the ulcer, in such circumstance, would in all probability heal, provided anti-syphilitic remedies were properly employed, there was no guarantee that surgery would not be required thereafter, for relief of scar tissue or adhesions, or both. And, if so, why not operate at once and be through with the case? To which I replied that, in the first place, there was no assurance that either scar or adhesions, or both, must necessarily follow the healing process in

syphilitic ulcer and, if they did follow, there was no assurance that surgery must necessarily be done for relief.

Besides, without a course of anti-syphilitic medicine, where surgery, alone is resorted to for the relief of the ulceration, there is every reason to expect recurrence of the ulcer, until the syphilitic dyscrasia is removed, or its activating influence is at least negated.

When the Chairman of your Committee on Cases recently asked me to present a case report at this meeting, it occurred that a patient, then under observation, whose history had suggested syphilis as the single causative factor in a proven diagnosis of ulcer, 2½ years previous, would be worth bringing to the attention of the Fellows of this society.

You will recall that Dr. Henderson but recently presented a most interesting report of a perforating duodenal ulcer, operated by him five years ago and again operated last year for recurrence. In this report, the literature was said to be replete with instances of the same patient being subjected to surgery one or more times—one case mentioned as having been operated five times for recurrent perforating gastric ulcer.

The experience of our patient is unique because of the healing of a duodenal ulcer two and a half years ago, after an active course of anti-syphilitic medicine, and the recent healing of an extensive ulceration of the epiglottis, following a similar course of medication. I trust a recitation of the facts, this evening, will not be without interest.

History: Mr. P., present age 50, first seen in 1926; occupation, officer, steam railroad; married at age 25, the father of one child.

To avoid consuming unnecessary time, I will say the case, two and a half years ago presented classical text-book symptoms of duodenal ulcer. Physical findings then and x-ray revelations made the diagnosis as certain as I have known a pre-operative opinion to be.

Concerning syphilis, there was a history of chancre at age 16, followed by a two year course of treatment; no further anti-syphilitic medication during the following twenty-nine and one-half years.

In addition to syphilis, patient gave a history of a pulmonary tuberculosis at age 30, for which he had been successfully treated during a two years' stay in the West. Examination revealed unmistakable signs of this encounter. There was no evidence of pulmonary activity in 1926, when I first saw him.

Treatment of the Duodenal Ulcer: Patient was advised to submit to a course of anti-syphilitic medication: he was told that surgery should not be done, except in the event the denudation would not heal or because digestive symptoms persisted, after healing had actually taken place. He was also inform-

*Read before the Jefferson County Medical Society, May 20th, 1929.

ed that, because of adhesions or because of scar, obstructive symptoms and other distressing digestive complaints were not uncommon in healed ulcer cases.

Not until the return of the patient, a few weeks ago, did I know Dr. Lucas had examined him in 1926, before I saw him, and had expressed similar opinion, but that several members of the Mayo group, who were consulted, urged that he be operated. Unwilling to permit surgery, it was finally agreed he would have recourse to spirocheticidal therapy and would return to Rochester for further examination, within a year.

Following a vigorous course of treatment, as stated, the ulcer healed. Surgery has not been done though I believe this is a case in which it should be done, for the relief of post-ulcer digestive symptoms.

Ulceration of the Epiglottis: Mr. P's case interests us on account of a more recent development. During the middle of February, this year, he suffered a severe cough, which became exasperating; March first, he went to Florida; the cough continued, with considerable muco-purulent expectoration; temperature, normal in the morning, rose to 99 2-5 in the late afternoon; about five pounds loss of weight was noted; no loss in strength; four sputum examinations, made by Florida State Board of Health, were negative for Koch organism.

Hoarseness, apparent early in the course of the malady, amounted to almost complete aphonia by March 1st; a Miami larynologist reported bogginess of cords, with ulceration of the epiglottis, the latter first seen about March 15th; patient was told that the condition was strongly suggestive of tuberculosis, but it might be malignant or syphilitic; the Wassermann was negative.

In a much disturbed state of mind, prepared for the worst, Mr. P. returned to Louisville; he was first seen by me April 25th. My notes of that date read: "Differential diagnosis must be made between syphilis, tuberculosis and malignancy."

Discussion: Return of weight and strength does not support malignancy, which condition is further negated by examination of blood, erythrocytes 5,320,000, hemoglobin 80%, (leucocytes 8,900; differential count—polymorphonuclears 68%, lymphocytes 30%, transitionals 2%; blood platelets, moderate number).

Absence of bacilli in the sputum and no evidence of pulmonary activity, cough abating, does not lend to the likelihood of a tubercular ulceration.

On the other hand, knowledge of our previous accomplishment in 1926 with anti-syphilitic drugs strongly suggests syphilis; treatment was accordingly recommended. It is

interesting to note that the patient had not followed instructions, given two and one-half years ago, which proposed that he receive at least one, and preferably two courses of Mercury, Iodides and Salvarsan each twelve months, for an indefinite period of time.

I am indebted to Dr. Max Bornstein for assistance in the diagnosis. The doctor clipped from the ulcerated area, two sections for microscopic study. His report, together with that of the pathologist, is appended.

Dr. Bornstein: Throat—Tonsils have been removed; fossae clean; pharynx negative; posterior rhinoscopy negative. Larynx—Epiglottis shows erosion of three-fourths of the left side, with considerable scar tissue; remainder of larynx negative.

Dr. Harry M. Weeter: Gross Description. Two pieces of tissue 2-4 mm. in size; moderately indurated. Microscopic Description: Sections show stratified columnar epithelium in practically normal arrangement with very little hyperplasia. This covers a connective tissue stroma densely and uniformly infiltrated by lymphocytes. In the larger of the 2 pieces submitted are two areas of cartilage cells; smaller piece contains no cartilage. Throughout all sections there is no evidence of malignant growth, and no area typical of tuberculous infection. Tissue throughout, however, shows marked chronic inflammation.

Microscopic Diagnosis: Chronic inflammation of tissue (from epiglottis). Re-examination of sections of above shows accumulation of lymphocytes around some vessels but no special infiltration around others. Beneath epithelial layer these cells form a dense zone. Microscopic picture of sections examined does not suggest any specific agent.

Recovery of Patient: Improvement was noted within a few days, following the instituting of treatment, which began on April 26th.

May 13th: Dr. Bornstein reports epiglottis healed, except at one small point.

May 16th: Ulceration practically healed.

May 20th: Healing complete.

Resume: The case illustrates the etiological part played by syphilis in the production of denudation of mucous surfaces. It emphasizes benefit resulting from a search for the cause.

DISCUSSION

Max Bornstein: In view of the fact that I have had the opportunity of seeing this patient in consultation with Dr. Solomon, I believe it worth while to discuss certain aspects of this case at this time.

At the time when the patient presented himself at my office for examination, I found the following clinical picture: Destruction of three-fourths of the left side of the epiglottis, while the remaining one-fourth was covered with

granulation tissue. The larynx proper was found to be negative.

In view of the fact that the patient had had both tuberculosis, and syphilis, some twenty years prior, and though these conditions were apparently stationary at the present time, it was quite impossible to determine accurately whether or not the patient's present condition was one of tuberculosis, syphilis, or cancer.

Due to this fact a biopsy was taken from a portion of the epiglottis, which was covered with granulation tissue, and sent to the laboratory for examination. The report of which has been previously read by Dr. Solomon.

I wish to state at this time that a case of this type always presents a problem, since in involvement of the epiglottis it is very difficult to make a differential diagnosis without microscopic examination of structure involved. Tubercular involvement of the larynx primarily is a rarity, and usually is secondary to involvement from the lungs.

Tuberculosis affects the interarytenoid space, arytenoid cartilages and least the epiglottis. While in cancer, clinical classification may be divided into intrinsic and extrinsic. In the former the vocal cords, ventricles, ventricular bands, and interarytenoid region. While in the latter the epiglottis, arytenoids, and aryepiglottic folds are involved more often in the order mentioned, though at times one may find involvement of both intrinsic and extrinsic structure.

Tertiary syphilis, which is the most usual involvement found, when involving the larynx is found in the following form:

First: Gumma.

Second: Ulceration.

Third: Perichondritis and necrosis.

Fourth: Resulting scars and adhesions.

Without any clear definite diagnosis of either tuberculosis or malignancy, and in view of the fact that the patient has had syphilis, and was treated for same a number of years ago, at which time there was an abatement of all signs and symptoms of his condition.

I believe that the condition which the patient presented was one of recurring syphilis, and that active antiluetic treatment was advised and same was instituted, along with local treatment with result that within a short period of time, there was healing of the denuded mucosa of the epiglottis.

With the above in mind, I feel quite sure that the case presented this evening was one of syphilis, and that the diagnosis of same was based chiefly upon the therapeutic methods rather than from the pathological report.

In closing I wish to take this opportunity to thank Dr. Solomon, for his paper which he has so well presented this evening.

J. Garland Sherrill: Dr. Solomon has introduced a very interesting topic for discussion. Whenever an individual has a lesion of the mu-

cosa or skin which is not clearly diagnostic, syphilis should always be held in the background as a possible cause. Quite recently a young man was sent to me for diagnosis of a lesion in his mouth, which resembled leukoplakia in some respects. It was a superficial ulceration involving the mucosa of the gums and the faucial pillars; it was bilateral and did not cause him any particular discomfort. At the first glance I had a strong suspicion that the lesion was luetic. This proved to be correct, the man had a four plus Wassermann blood reaction, and the ulceration disappeared promptly under antisyphilitic treatment.

Some time ago Dr. Crice referred to me a man who had symptoms indicating the presence of a gastric lesion the nature of which seemed uncertain. The clinical manifestations were atypical, and we finally decided that the patient had syphilis. We traced his history, and as in Dr. Solomon's case, with positive findings of lues. Let me repeat: whenever there is a lesion on mucosa or skin not accounted for by other disease, we are certainly justified in investigating the question of syphilis. Do not be misled by the fact that the patient does not show a positive Wassermann reaction, because in many instances syphilis is present with a negative Wassermann. This is particularly true of lues of the liver and the mucous membranes. After a course of antiluetic treatment of proper duration sometimes spirochaetes previously inactive are brought to light. It is stated that in 66-2-3 per cent of cases of syphilis of the liver the Wassermann blood reaction is negative. The various lesions that occur in syphilis were familiar to physicians in earlier days, and they had a wide experience in the treatment of this disease. With our laboratory tests we are better able to confirm the diagnosis than were the older practitioners.

During discussion with a pathologist with reference to the diagnosis of syphilitic ulcer of the stomach, when asked if he could differentiate for me a syphilitic lesion of the stomach, he admitted that he could not. Syphilis of the stomach is rare. I do not recall a single instance in my experience where I could positively identify as syphilitic any lesion of the gastric mucosa. Of course if *spirochaeta pallida* are found a positive statement may be made. The spirochaeta may have disappeared and the remaining inflammatory lesion cannot be identified as syphilitic although it is the effect or the result of an old luetic process.

My experience with perforating duodenal ulcer is that the perforation is small in size, whereas ulcer in any other portion of the intestine ruptures with a larger opening. Why should ulcer of the duodenum be of small size and tend immediately to perforate, and why should ulcer of the stomach and pylorus be larger and perforate rather slowly? These are interesting

points to study and clarify.

As to the causation of ulcer in the duodenum and stomach: It is doubtful if syphilis is ever a causative factor of duodenal ulcer. The ulcer is more than likely due to inflammation and infection, with embolic infarction.

Dr. Solomon has opened a very wide field for discussion. As Dr. Bornstein has said, lesions of the nature described may be the result of three diseases: (1) tuberculosis, (2) cancer, and (3) syphilis. If cancer and tuberculosis can be excluded, the diagnosis of syphilis is justified. Syphilitic lesions of the mucosa are frequently overlooked by physicians, who are superficial observers of their patients.

Elmer L. Hendersos: When a lesion of the skin or mucosa cannot be diagnosed as something else, syphilis should always be suspected. I recall a man who came under my observation three years ago presenting the classical symptoms of duodenal ulcer, and that diagnosis was made. It has been my custom for a number of years to have a Wassermann blood reaction test made in every case where the patient presents symptoms of gastric or duodenal ulcer. This man had a positive Wassermann. Antiluetic treatment was given for three or four months and he then passed from observation. He returned after two years with recurrence of all his former symptoms. He still had a positive Wassermann. Anti-syphilitic medication was again instituted with prompt subsidence of all clinical manifestations. Since then he has been more careful about reporting for treatment and has had no recurrence of symptoms.

Another man came to me with leukoplakia of the tongue. The Wassermann reaction at the time was reported as two plus. From the history and positive Wassermann I thought the lesion must be syphilitic. He was given antiluetic treatment without any effect whatever on the lesion. No further time was wasted in specific medication. Under radium treatment the leukoplakia promptly disappeared and the patient has remained well since.

I think in all cases of duodenal and gastric ulcers we should consider syphilis as a possible factor and have a Wassermann reaction test made.

Edward R. Palmer: Dr. Solomon has presented a very interesting report. I would like to emphasize what has been said about the importance of not allowing the laboratory to take the place of the clinical diagnosis acumen of the observer which has been so aptly illustrated by Dr. Solomon in his paper. There are two opposing factions among modern authorities in medicine today. There has been on one hand too much tendency on the basis of a positive Wassermann blood reaction to consider any lesion which may be present syphilitic, and on the other hand too much tendency to exclude syphilis on the basis of a negative Wassermann when the lesion is undoubtedly syphilitic.

I cannot discuss gastric and duodenal ulcers presumably due to syphilis, because they very seldom come to the attention of the syphilologist, but lesions of the mucosa of the buccal cavity, tongue and pharynx are quite frequently brought to our attention. The most common location of these lesions is on the anterior two-thirds of the dorsum of the tongue and most commonly found as a late secondary manifestation.

This lesion is called superficial glossitis, and is a precursor of syphilitic leukoplakia. The lesion is characterized by denudation of the epithelium, it has a dry appearance and is sometimes called a dry mucous patch. It varies in size from a small spot to a quarter or half silver dollar. Sometimes the lesion extends around the border of the tongue. The Wassermann reaction may be positive or negative, generally the latter. The condition we are dealing with here is on the borderline between a late secondary and tertiary syphilis, and the pathology underlying that is infiltration of plasma cells. It is really a diffuse gumma which will either become larger and invade the mucosa with the formation of scar tissue, or undergo retrograde changes with the formation of ulcer.

The feature of greatest interest to me in the case reported is that despite the negative Wassermann reaction Dr. Solomon decided the lesion was syphilitic, and the prompt response to the therapeutic test is proof positive of the accuracy of his diagnosis. I thank him for his excellent report.

Leon L. Solomon, (in closing): I thank the gentlemen for their splendid discussion, which has surely been interesting and to me, illuminating.

It was not my purpose to convey the idea that syphilis was frequently associated with denudation of the gastro-intestinal mucosa. I purposed rather to emphasize the fact that the disease should be suspected and that the use of anti-syphilitic remedies will often be of distinct service. I also desired to make plain that a man who had syphilis, twenty or thirty years ago, and who thereafter is relieved by anti-syphilitic medication, should have persistent treatment—at least one or more courses of anti-luetic medicine, yearly.

The case under discussion had one only course of treatment at Hot Springs, when he was 16 years of age (34 years ago). Unfortunately, he was told he had been "cured."

The word "cure" should not be used in connection with many human ailments and certainly never employed in connection with syphilis. Unquestionably our patients get well of the disease, but they are not as a rule cured, in the sense that they remain well. Looking back over a period of thirty-five years, I realize that with few exceptions, only those patients have remained well, who received regular courses of treatment, applied one or more times yearly.

As student of a learned syphiligrapher in Berlin, in 1895, when he employed the word "cure," unconsciously and unwittingly, I indicated by my expression, that I held contraopinion. I was singled out by the teacher and was greatly embarrassed when he said to me, "You evidently do not believe that syphilis is cured." I was forced to tell him I had been so taught. Having learned from the father of our esteemed colleague, Dr. Ed Palmer, that syphilis is never cured and that the word cure should not be used in the presence of our patient; having heard as much from those great clinicians, David Yandell, Wm. Bailey, Turner Andersen, John A. Ouchterlony, my experience has completely corroborated their viewpoint.

The case, I am permitted to bring to your attention this evening, while it illustrates the tendency of syphilis to show its monster head, where treatment is neglected—witness the appearance of an ulcer of the mucous membrane of the duodenum—is interesting, because, though this ulcer heals promptly and effectually under appropriate treatment, the case once more excites interest, when, after a few years, the same patient returns to us with ulceration of the epiglottis, resulting from the same disease and due to the fact, that the patient had neglected routine treatment, ordered or him not less than twice per year.

INTRACRANIAL INVOLVEMENT COMPLICATING EXACERBATION OF CHRONIC MIDDLE EAR INFECTION: REPORT OF THREE CASES*

By A. L. BASS, M. D., Louisville.

The diagnosis of extradural abscess, as well as other forms of intracranial suppuration, is still a difficult task. The prognosis is always serious. Auvert (1905) collected reports of nineteen such cases in which there were eight deaths, six recoveries, and five questionable results. There were thirteen adults, ten males, three females, one girl and one boy. In six cases abscess appeared as a swelling in back of neck, six in the neighborhood of the external ear, two in the temporal region, two in the mastoid region, one in the frontal region. Lavin reported an intracranial abscess simulating a meningocele, but at autopsy proved to be an extradural abscess with spontaneous rupture through the medio-frontal suture. Potts, Miranda, Loroyenne, Porte, Kan, Halpern and Stulik have reported one case each.

Case I. Lateral and cavernous sinus thrombosis complicating chronic middle ear infection. Patient, W. R. R., aged 37 years, seen November 10th, 1928. History: at the age of 8 years he had measles complicated by bilateral otitis media. Both ears continued

to discharge at intervals afterward. Two years ago tonsillectomy was performed and a polyp was removed from the right ear at Ford Hospital in Detroit. He had no further trouble until two months ago, when he began having pain in the right ear, a dull ache, which comes and goes, and for the last three weeks has been in bed. Has lost about fifteen pounds in weight.

Examination: The patient is thin, poorly nourished, worn expression. Nose, throat and mouth negative. Left ear negative save retracted and thickened drum, the result of an old infection which had healed. The right ear presented canal containing discharge with foul odor and polyp coming from posterior half of drum area. There was slight tenderness on moderate pressure over the antrum. Temperature 98.6° F., pulse 60, respiration 20; blood pressure 120-82. Blood examination: hemoglobin 80, erythrocytes 4,390,000, leucocytes 20,050; differential, polymorphonuclears 80, lymphocytes 13, endothelials 5, eosinophiles 2. Urinalysis: color amber, specific gravity 1020, sugar, abumin, acetone and diacetic acid negative.

Roentgen-ray findings: Roentgen-ray examination of mastoids. Film of the left mastoid normal. The cells are small and the walls are dense, but they are sharply outlined and the density of the entire area is normal. The right mastoid is quite different in appearance. The density of the bone is increased throughout the entire area. No cell outlines are seen. This is especially noticeable in the tip, where the cells are large on the opposite side. One cannot be sure of any cell wall destruction as the structures are so dense that it is impossible to identify any cell walls. The appearance is that of chronic mastoiditis on the right with considerable bone sclerosis.

Diagnosis: exacerbation of old chronic middle ear infection. Treatment: Radical mastoidectomy advised. Operation November 11th, radical mastoidectomy being performed. The antrum was as large as an ordinary lead pencil, due to necrosis, and was filled with degenerated material. The bridge was taken down, the malleus and incus removed, "T" flap made in canal, and the canal packed moderately tight with 5 per cent iodoform gauze. The posterior incision was then closed. The patient went to the operating room at 4:00 P. M. Temperature 98.6° F., pulse 80, respiration 20. Returned at 5:45 P. M. Pulse 80, respirations 20. November 12th, temperature range 98.8 to 99.8° F., pulse 65 to 80, respirations 20; November 13th, temperature 98.4 to 102° F., pulse 65 to 100, respirations 20; November 14th, temperature 99 to 100.2° F., pulse 55 to 72, respirations 20.

On November 14th the dressing was changed and the patient was apparently doing well.

*Read before the Jefferson County Medical Society, April 15th, 1929.

1 left town that afternoon and did not see him again until the morning of the 18th, during which time he had been seen by Drs. Richeson, Hall, Spurling and Watkins. That afternoon the right eye began to protrude, the lids and conjunctiva became edematous. The next morning the left eye began to protrude, the lids and conjunctiva becoming edematous. November 15th, temperature 99.2 to 100.2° F., pulse 55 to 72, respirations 20. November 16th, temperature 99.8 to 102° F., pulse 55 to 70, respirations 20.

Roentgen-ray findings, November 16th. Roentgen-ray examination of the nasal accessory sinuses. Anteroposterior and lateral films of the nasal accessory sinuses show well developed and well ventilated frontals. The left antrum and ethmoid appear well developed and well ventilated. There is a faint cloudiness in the right ethmoid and in the right maxillary sinuses. Neither is completely impacted. The right orbit shows definite increase in density apparently due to edema. In the lateral film the sphenoid cells appear well developed and well ventilated.

Spinal puncture: cell count 55, globulin negative. Fluid clear, sugar reduces CuSO₄, culture negative after 72 hours.

November 17th, temperature 100.2 to 103.4° F., pulse 60 to 80, respirations 20. November 18th, temperature 97.4 to 99.4° F., pulse 80 to 100, respirations 20. This was the morning when I returned and saw the patient with marked chemosis of the lids, edema of the conjunctivae, protrusion of the eyes, lids barely coming to the corneal limbus. I believed that the diagnosis was easy, and informed the father that there was very little chance for recovery and nothing to be done,—that I was sorry.

Ophthalmoscopic examination of the fundi from time to time showed practically no abnormality.

November 19th, temperature 99° to 102.2° F., pulse 80 to 100, respirations 20. November 20th, temperature 98° to 101.2° F., pulse 72 to 100, respirations 20. This day I told the father that it might be giving the patient the benefit of the doubt by ligating the right internal jugular vein, which was done under local anesthesia that afternoon. The vein was collapsed and about one inch was resected. The patient gradually went from bad to worse and died the next day at 10:15 A. M.

A noteworthy something about these patients is the serious and hopeless condition with apparently little discomfort.

Notations on the chart: November 16th, pain in back of neck 10:00 A. M. Patient having difficulty in breathing 4:00 P. M. November 17th, chill lasting 20 minutes. Temperature 100° F., pulse 80, respirations 20. November 19th, patient very uncomfort-

able, back rubbed with alcohol. November 20th, patient very restless, given morphine 1-6 grain hypodermatically. Urinalysis: color amber, specific gravity 1010, reaction acid, sugar negative, albumin 1 plus acetone and diacetic acid negative. Blood examination: leucocytes 38,250; differential, polymorphonuclears 88, lymphocytes 9, endothelials 3. The blood culture was negative. November 21st, 7:30 A. M., patient in stupor. At 9:05 A. M. he had a convulsion lasting about five minutes; at 9:30 another convulsion, lasting about five minutes; at 10:00 A. M. third convulsion lasting about four minutes. At 10:15 A. M. the patient stopped breathing.

Case II. Meningitis, lateral sinus thrombosis (right side) complicating chronic middle ear infection. Patient, O. S., aged 16 years. Family history: mother, aged 58, has ear trouble. Father died at 64, pneumonia. Two sisters living and well. Five brothers, two died before patient was born, three living and well.

Personal history: Patient had measles at the age of 9, complete recovery. Tonsillitis occasionally when a child. Pneumonia at the age of 15-16, with complete recovery. Weight 116 pounds, has lost 8 pounds within the last six months. Tonsillectomy at the age of 9 years.

Present history: The patient was admitted to the Louisville City Hospital January 15th, 1929, complaining of pain in the chest three days following a chill, dyspnea, prostration, pain in the right ear, blood-streaked sputum.

Examination: The chest shows limitation of expansion on left side, dullness on percussion on left side posteriorly. Bronchial breathing with low crepitant rales. Temperature 103.5° F., pulse 130, respirations 33. Blood pressure 110-38. Blood count: leucocytes 14,200; differential, polymorphonuclears 82, lymphocytes 18. Urinalysis: color amber, clear, specific gravity 1012, albumin a trace. The right ear drum was incised followed by irrigations three times daily.

Roentgen-ray findings: Bedside roentgen-ray examination of the chest shows cloudiness and mottling throughout lower half of the left lung, suggesting early lobar pneumonia.

The patient's temperature, pulse and respirations gradually returned to normal and remained so from the 19th to the 25th, when he began to complain of pain in the left ear. From the 25th to the 28th, his temperature ranged from 100 to 102.6° F., pulse 80 to 90, respirations 20 to 24. Examination at that time showed: ears, right drum discharge, left drum cloudy, congested, with slight distension. No mastoid tenderness. Bilateral tenderness of the neck with little or no edema. Chest examination showed no extension or exacerbation of resolving pneumonia in left

base.

Roentgen-ray examination of the chest at that time (Jan. 30th, 1929) showed marked clearing in left base, no evidence of consolidation in either lung field. The heart appears to be considerably widened. Widening in the area of left auricle is of normal size and position in the film with slight relative widening in area of left auricle.

Heart examination, January 28th 1929: Heart enlarged with accentuated first mitral sound and faint systolic murmur at the apex, not transmitted. The rhythm is regular.

Nervous system: Brudinski positive; Kernig positive, more marked on left side. Babinski, Oppenheim and Chaddock negative.

Ophthalmoscopic examination: The median margin of both discs possibly slightly blurred.

Spinal puncture: Fluid moderately cloudy, 996 cells per cubic millimeter. Spinal fluid pressure (H-20 manometer) 190 mm. and fluctuated synchronously with respiration. Pressure on the right jugular vein caused slow rise from 190 to 230 to 240 (8 seconds) followed by slow decline on release of pressure. Pressure on left jugular caused an immediate rise (4 seconds) from 190 to 410 with subsequent immediate decline on release of pressure.

Blood count and urinalysis at this time (January 28th, 1929) showed: Leucocytes 13,150; differential, polymorphonuclears 70, lymphocytes 30; hemoglobin 80 (Sahli). Urine: color amber, cloudy, reaction acid, specific gravity 1015, albumin and sugar negative.

Clinical impression (diagnosis): Meningitis, lateral sinus thrombosis (right), acute otitis media (bilateral), massive resolving bronchial pneumonia. Possible rheumatic heart disease.

Operation and findings: Both ear drums intact, cloudy, congested and bulging. Bilateral myringotomy was performed, and there was quite an active discharge, showing that the accumulated material was under considerable pressure. The right internal jugular vein was ligated. It was collapsed and about one inch was excised. The right mastoid was then opened and found to be sclerotic, showing that it had been previously infected. There was free pus and granulations in the mastoid antrum. Smear from the pus showed staphylococci. The lateral sinus was uncovered, incised and found to contain free pus. A free flow was established toward the torcular and the sinus obliterated with iodoform gauze packing. The patient's temperature was 102.6° F., pulse 99, respirations 2, at time of operation, gradually returning to normal within the next twenty-four hours and remained so until he left the hospital February 23rd, twenty-five days after operation.

Spinal fluid withdrawn January 28th, 1929, just prior to operation, showed 996 cells per cubic millimeter; January 30th, 131 cells, globulin X; January 31st, 100 cells; February 2nd, 99 cells; February 4th, 104 cells; February 9th, the last puncture, 14 cells.

The dressing was changed on the fifth day when the sinus was not obliterated. It was repacked and dressed every forty-eight hours, and at the fourth dressing the sinus remained obliterated. Blood culture and Wassermann blood reaction negative. The spinal fluid was negative on culture. The left ear was free of discharge about ten days after operation, following myringotomy and warm boric acid irrigations.

Case III. Extradural abscess complicating chronic middle ear infection. Patient, J. S., aged 35 years, seen February 7th, 1929. Family history: Father died at the age of 49, possible meningitis following influenza. Mother, three brothers and five sisters living and well. One brother and one sister died in infancy from spinal meningitis. Patient married, wife living and well, no children.

Personal history: The patient had influenza ten years ago complicated by bilateral middle ear involvement. Ears discharged for three or four weeks, and have discharged at intervals since.

Present history: He had influenza three or four weeks ago. About the same time he had pain in the right ear followed by discharge in about twenty-four to forty-eight hours. He was apparently doing well until three days ago when he awoke with frontal headache which drugs would not relieve, —even morphine. Since then he has had periodical pain in the right side of the head. Jarring aggravates his condition.

Examination: The patient is conscious. Nose and throat negative. Right ear drum congested, infiltrated, pin-point perforation posterior to center. Discharge foul. Some tenderness on pressure over the mastoid antrum. Slight pain on flexing head. Kernig positive; Babinski negative. Temperature 98.8° F., pulse 100, respirations 24. Blood examination: Leucocytes 12,500; differential, polymorphonuclears 80, lymphocytes 16, endothelials 2, eosinophiles 2. Urinalysis: color amber, specific gravity 1022, reaction alkaline, albumin a trace. Microscopic: triple phosphates and bacteria present. Spinal fluid: cloudy, globulin negative, bacteria, none found in centrifuged specimen. 912 cells per cubic millimeter, 73 per cent polymorphonuclears.

Roentgen-ray findings: Roentgen-ray examination of mastoids, February 9th, 1929. The right mastoid is involved in a dense bony shadow with two areas of lessened density that may well represent cholesteatoma. No

normal cells are seen on this film. A faint dense shadow two and one-half centimeters long by one-half centimeter wide is seen along the posterior margin of this dense shadow that probably represents the lateral sinus. The left mastoid shows a few fine cells in the region of the antrum and above the antrum. The remainder of the mastoid is involved in a dense mass as is so frequently seen in sclerotic mastoid. Anteroposterior film made to bring out the mastoid tip gives no further information.

Diagnosis: Meningitis complicating exacerbation of chronic middle ear involvement.

Operation: Mastoid antrum opened through sclerotic mastoid. The antrum was filled with pus and granulations. The dura was exposed and free pus found. The abscess wall was sought with gentle probing and bone removed over it to the extent of one inch. The bone was removed practically downward to the middle ear cavity from which direction the pus was coming. The dura was thickened and infiltrated, the result of infection. There was little or no tension of the dura. A small incision was made in the dura, no subdural pus. The wound was packed with 5 per cent iodoform gauze and dressing applied.

Report of swab from mastoid antrum: "Very few bacteria found. A few small cocci were found within the polymorphonuclears." Culture incubated sixteen hours, no growth at 37° C. Swab from extradural abscess: The pus cells and bacteria much more numerous than first swab. Many small cocci plus very slender bacilli,—resembling Pfeiffer's influenza bacillus. A blood-agar plate from this swab showed no growth after sixteen hours incubation.

The next day (February 8th) the patient's temperature was 98.9° F., pulse 100, respirations 20. He took liquids by mouth. He complained of pain in the head. Spinal puncture was performed by Dr. Buckles. February 9th, temperature 98.8° F., pulse 80 to 90, respirations 20. The patient spent a comfortable day apparently.

February 10th, temperature 98.6° F., pulse 70, respirations 20. At 6:30 A. M. the patient complained of intense pain in the head, for which he was given morphine, 1-6 grain hypodermatically. Lumbar puncture by Dr. Buckles at 10:00 A. M. showed 1701 cells per cubic millimeter; polymorphonuclears 81; lymphocytes 18. Another lumbar puncture was made at 5:00 P. M. At 9:00 P. M. the patient complained of severe pain in the head and was given morphine, 1-6 grain hypodermatically.

February 11th, at 4:00 A. M., there was an emesis of green-like substance; patient still complaining of intense headache, for which he was given morphine 1-6 grain hypodermatically.

ly. At 9:15 A. M. when I changed the dressing, he was in a stupor apparently. I disturbed him as little as possible in changing the dressing. Lumbar puncture by Dr. Buckles at 10:00 A. M. showed 6804 cells per cubic millimeter; polymorphonuclears 91. At 10:30 A. M. the patient drank 150 c. c. of orange juice. At 10:45 A. M. the patient could not be aroused. At 10:55 A. M. he died.

DISCUSSION

Frank Pirkey: Dr. Bass has reported three very interesting cases and has brought up a complication which it is always important to bear in mind when dealing with purulent involvements of the middle ear and mastoid.

Barring traumatism, epidemic cerebro-spinal and tubercular meningitis, the majority of all intra-cranial infections originate in the middle ear. This causes us to always be on our guard for an intra-cranial involvement in any case of mastoiditis which does not subside after the proper surgical procedures. It may be sinus thrombosis, meningitis or brain abscess. The true condition must be determined by careful differential diagnosis.

Dench reported that in a period of eight years in the New York Eye and Ear Infirmary, that out of over 64,000 cases of aurai suppuration of all kinds there were 218 cases with this complication.

This is about one in 296. Phillips investigated 29,000 ear cases over a period of seven years at the Manhattan Eye and Ear. He found 118 cases of intra-cranial involvement or about one in 248.

When we think of the thinness of the inner table of the temporal bone and that areas of it are bathed in pus it is remarkable that there are not many more such complications.

R. Glen Spurling: I had the pleasure of seeing all three of the patients of whom Dr. Bass has spoken.

The first one certainly turned out most happily. I rather disagree with Dr. Bass in his statement that the patient had meningitis, that is if he means to imply that he had pyogenic meningitis. As I remember the details of the case, the repeated cultures and smears of the spinal fluid failed to reveal organisms; therefore, I am certain that the meningitis was an irritative one, a so-called serous meningitis. Once the focus was removed, namely, the thrombosed sinus, the source of irritation was removed, therefore, the meningeal symptoms subsided. I think this is an extremely interesting example of the value of the Quickenstedt test in diagnosing lateral sinus thrombosis. I have seen several such cases which were recognized by the aid of this test when the clinical symptoms were too inconclusive to arrive at a positive diagnosis. If this simple test is properly performed, it should give accurate information before the typical clinical signs of sinus thrombosis are present.

The second case I consider to be one of serious meningitis secondary to an extradural abscess; in fact, such a clinical diagnosis was made, and the abscess demonstrated at operation. I believe the patient died from a pyogenic meningitis due to a secondary invasion of the dura following the operation.

A. L. Bass, (in closing): Dr. Strickler just asked me why the dura was opened in the case of extra-dural abscess. I opened the dura because there seemed to be some tension. The culture was negative so I do not believe we did much damage by opening the dura.

I am glad Dr. Spurling spoke of the newer diagnostic methods in lateral sinus thrombosis. We had no difficulty in determining the side on which the thrombosis existed. The Quirkenstedt test decided for us.

Some of you may recall that case of lateral sinus thrombosis in a child that I reported before this society a year or two ago. The child had a bilateral mastoid operation and continued to have a temperature from 98.6 to 105° F. for ten days to two weeks. One side practically healed, while the other side had made little effort at healing, which gave us the clue as to which side to ligate the jugular and obliterate the sinus.

Some one spoke about the percentage of cholesteatoma in chronic middle ear infection. I have asked the relative intracranial involvement complicating chronic middle ear infection of several colleagues and they have all hesitated about answering or admitting they did not know. So far as I am aware the percentage has not been accurately determined, but is estimated as about one in 500.

Bleeding in Pregnancy and Malformation of Fetal Heart.—Lowenstein reports the case of a young woman with uterus septus duplex, who had previously borne a microcephalic child. The second pregnancy was undisturbed up to the eighth month, when bleeding set in. As he was unable to control it, he delivered the woman by cesarean section. The child was born cyanotic and asphyctic. With difficulty it was kept alive nine hours. Necropsy showed malformation of the heart. Lowenstein interprets this case as one of premature separation of the placenta and includes the pathologic condition of the fetus among the causes which brought this about, which were, in addition, a railway journey and the double uterus.

THE IMPORTANCE OF AN EARLY AND CORRECT DIAGNOSIS*

By E. B. HOUSTON; Murray, Keys and Houston Clinic.

In choosing the subject of this paper it was not my intention to try to bring to light any new scientific facts concerning diagnosis, nor to discuss in particular any diagnostic procedure. It is my purpose merely to make a few general observations on the subject of diagnosis in the abstract, in the hope of emphasizing facts already known.

Diagnosis is the keystone of the successful practice of medicine and surgery. Having determined the pathology present, any number of text books will give excellent suggestions and directions as to the line of treatment to be pursued. Many different pet methods of treatment of the same condition will produce just about the same results in the majority of common ailments, but the correctness or incorrectness of the diagnosis frequently means the difference between life and death of the patient.

Diagnosis is an art, a science and a philosophy. It is an art, in as much as it requires the development of the senses to a high degree of perception in detecting the departures from normal of the various structures and functions. It is a science in that it brings to bear on a given problem the fundamental sciences of physics, chemistry, bacteriology and mathematics. So a successful and correct diagnosis is built on a logical sequence of facts aided by classified knowledge. It is a philosophy, as every diagnostic problem furnishes food for profound reflection and exercise of the most versatile mind in the study of factors which influence departures from normal of structure and function in the human body.

A correct diagnosis requires knowledge of the normal structures and functions, the usual phenomena presented when departure from normal takes place, the ability to elicit these phenomena by every possible means and to recognize them, a sound judgment to correlate the phenomena and to ascribe to each its proper significance and to draw conclusions from the mental picture resulting. If all variations from normal in the structures and functions of organs caused constant and typical signs, then practically no psychologic process would be necessary to make a diagnosis. Then every patient could make his own diagnosis and get his treatment in the same way. That which distinguishes the diagnostician is the ability to analyze the case presenting phenomena varying from the typical

*Retiring President's Address before the Southwestern Kentucky Medical Association May 14th, 1929.

and usual, so to interpret the findings that the underlying perversion of structure and function of an organ can be discovered.

The practice of medicine in the twentieth century has become one of the most complex and least fixed of all vocations. Facts have accumulated so rapidly in the last fifty years and our methods of practice have changed so decidedly even in the last twenty-five years that I fear we, as members of that profession, are in danger of entering a period comparable in history to that which followed the death of Hypocrates. You will recall the history that he, with his contemporaries brought order out of chaos by nihilistic efforts against the prevailing mysterious conception of disease, its cause and treatment. He set his feet upon the ground and with his back against the wall of facts, attempted to separate the things known from the things unknown. He took stock of the art and philosophy of medicine and introduced methods of observations, out of which came systematic study and correlation between the structures in disease and the signs and symptoms presented. So after every great epoch there follows a period of over-zealous enthusiasm, usually without a proper material basis, without the necessity of improvement and without the stage-setting which paves the way for fundamental discovery.

The last half of the nineteenth century was perhaps the greatest period in the history of medicine in so far as fundamental knowledge of disease is concerned. With it came greater microscopic, chemical, physical, electrical, photographic and surgical vision. With it our diagnostic methods and opportunities improved greatly. So symptoms and signs are not the only clinical methods of diagnosis. Now when a patient comes to a physician for the first time he places on him a heavy responsibility, under certain conditions the heaviest a human being is called on to bear. Two questions, implied or expressed, must be answered if the patient is to be repaid for his confidence and outlay. What ails me? What must I do to be cured? The conscientious physician looks on these questions as a challenge which can be met only by a true diagnosis and clear-cut helpful advice and treatment. Such a diagnosis is a problem of logic, no less rigorous and exacting than a problem in any of the natural sciences. The difference consist in the elusiveness and multiplicity of the medical premises. The physician's end and aim is exactly that of the astronomer, the mathematician or physicist, to find the truth.

A physician can become a reasonably good diagnostician only by practicing constantly the technic of diagnosis. There is a close analogy between clinical medicine and music.

One may know harmony, counterpoint and all that makes up the science of music, but unless by dint of hard practice one masters the technic of ones instrument there will be no music. A physician may possess all the textbook knowledge, he may be capable of passing a wonderful written or oral examination, but without the technical expertness to apply this knowledge he will be hopelessly lost at the bedside in the complexities of a medical case.

May I call your attention to one of the most common diseases, tuberculosis, where an early and correct diagnosis is so important. A few years ago a group of prominent physicians, including Osler, Welch and Trudeau, created an organization for intensive warfare against this disease then foremost among the causes of death. It was then recognized that the most successful medical attack upon tuberculosis lay in an early diagnosis and in prolonged treatment upon the lines which Trudeau had begun to demonstrate many years before.

Since the creation of that organization in 1904, the mortality from tuberculosis, has decreased from 200 per 100,000 of population to 80 per 100,000 of the population. A decrease of 60%, and this much dreaded disease has fallen to the seventh place among the causes of human mortality. During these twenty-five years, no specific or definite cure of tuberculosis has been discovered. The large number of alleged specifics which have appeared have been tried out and discarded. The chief contribution which the medical art has made to the reduction of mortality in this disease has been thorough early diagnosis and earlier and more persistent treatment along simple and generally known lines. And now, students of tuberculosis announce as their aim for 1929—"Earlier diagnosis and earlier and more persistent treatment." The marvelous success that has come in the management of this dreadful disease that it has been frequently said of late that there is a stage in every case of tuberculosis in which the disease is curable. This would seem to imply that the mortality is due to failure in making an early diagnosis. This statement is not exactly true, as in miliary tuberculosis and in certain acute explosive types, the patient is doomed at the time the earliest possible diagnosis can be made. It is true, however, that a very large percentage of the cases, perhaps 80 to 90% end in failure due to belated diagnosis and faulty methods or too brief duration of treatment.

While correct diagnoses are a source of satisfaction to ourselves and patients, and while we can be pardoned for patting ourselves on the back when we clear up an obscure case and have it proven at operation, by therapeutic test, or at post mortem. It is true we learn very little from our successes. It is from our

mistakes that we learn the most. And this statement presupposes that our mistakes are recognized and admitted. If our mistakes are admitted, the fact analyzed and studied carefully, and we openly and impartially make an effort to locate the cause of our mistakes, we are not only fair to ourselves and patients, but we have learned something that will prevent us from making the same mistake again. A study of the records of any large hospital or medical teaching center will show that even under the best conditions, with the best trained clinicians and laboratory workers and every facility for the study of patients, the per cent of incorrect diagnoses is large enough to make all earnestly stop, and consider if we have exhausted every means of determining what is the matter with our patient in every case, and if after all we are the diagnostician we thought we were. Cabot of the Massachusetts General Hospital, gives very interesting statistics as the result of the study of three thousand post mortem examinations and the antemortem clinical records. They show an average of 66% correct diagnosis in all conditions. For instance, in acute nephritis only 16% were correctly diagnosed. Failure to recognize it occurring in 62% and the condition diagnosed when not present in 22% of the cases. In lobar pneumonia 74% of the cases were correctly diagnosed, failure to recognize its presence being the case in 15%, and the condition diagnosed when not present in 11%. In seven types of cardiovascular disease the average per cent of mistaken diagnosis was thirty-four thoracic aneurisms heading the list with 50% failures, and aortic regurgitation being at the bottom with 16% failures. In the face of such failures the doctor who is so cock sure and positive in his diagnosis, or the one who specializes in "Snap diagnoses" makes a ludicrous picture and is one to receive a few sudden jolts. If he is honest enough to admit his mistakes, or knows enough to recognize them, and has the slightest vestige of the spirit of scientific medicine, these jolts are good for him, his patients and the progress of medicine in general.

The reason for not making more correct and early diagnoses might be summarized as (1) Ignorance, (2) Faulty examination of the patient, (3) Obsessions, and (4) Errors in judgment.

For gross ignorance, or ignorance of the fundamentals of medicine there is no excuse. An example would be the case of a woman having a chill and rise of temperature with a pain in the lower abdomen three days after delivery. The diagnosis was malaria without any facts to support such diagnosis, and quinine and calomel given for several days. Then a consultant found a leucocyte count of

35,000, with fixation of the uterus, and rigidity of the abdominal walls. But fortunately gross ignorance is becoming more rare and can only be remedied by better clinical training. We are all guilty of more or less of relative ignorance, ignorance of the most recent advances in medicine.

Medicine is advancing at such a rapid rate now that only constant study and assiduous application will prevent one from becoming in time grossly ignorant. In this connection there will be found two types of men. One will scoff at and refuse to recognize advances as being of value, belittle all innovations, and hold only to that to which he has become thoroughly familiar. The other will eagerly take up every fad, every new technique, and theory and religiously accept them as gospel, without knowing anything of their real worth. Of course the proper attitude is to keep an open mind and always be willing to be shown the value of an innovation, but wait the verdict of competent clinical research workers, who are capable of drawing unbiased conclusion. In considering the question of ignorance it must be recognized that there are conditions undiagnosable by the means present at our command. If the physician has exhausted every means of examination, and has carefully studied all the phenomena presented, and then fails to make a diagnosis, he has done his full duty.

Faulty examination of the patient is in my mind by far the most important cause of mistaken diagnosis, and it is the one most easily remedied. There is no excuse in the world for failure to examine a patient. I remember this case being reported by Dr. Sidney J. Myers, when I was a student, a boy of twelve, was taken to his family physician for bed wetting. The parents stating that he was passing large quantities of urine. Without further ado the physician, who evidently had surgical ambitions, removed a rather long prepulse. Infection of the wound and a very prolonged period of healing did not make him suspicious, nor did the development of an enormous appetite and loss of weight further convey anything to his mind. The onset of a diabetic abdominal crisis with terrific pain caused the physician to send the boy to a hospital for an operation, where he very promptly died in a diabetic coma which developed on the way to the hospital. So a most important and necessary part of an examination is the clear cut history of the case, which has been an almost lost art both in the hospitals and the offices of the profession. Many histories are poorly taken, if taken at all, and then they are merely a jumbled mass of unrelated facts. The object of a history is to flash upon the mental screen of the observer a clear, concise picture of the events of a

patient's life. It should contain the present complaints arranged in the order of their importance with the idea of grouping them in syndromes, so that proper evaluation may be given them. A mere mass of unrelated facts, bearing no correlation to each other and leaving no sequence in their appearance, cannot be called history.

We are again all more or less guilty of obsessions. If we have been making a special study of a particular condition or disease, we are naturally on the lookout for that disease. But the man following the narrow specialties are the most often guilty of allowing obsessions to misguide them. Given a woman with a headache, the rhinologist will find sufficient deviated septa, enlarged turbinates, infected ethmoids, etc., to cause the headache. The same patient upon applying to a gynecologist will be found to have all manners of prolapses, retroversions, cystic ovaries, lacerated perineums, and torn cervixes enough to cause two headaches. The eye man finds errors of refraction and fits glasses. After her nose has been cleaned out, her round ligaments shortened, one ovary removed, cervix repaired and still she gets no relief, some man with no pet theories makes a thorough general examination and finds she has nephritis, syphilis, chronic constipation, faulty posture or psychoneurosis.

As to errors in judgment, if made honestly, no criticism can be attached. The human brain is not a perfect machine, you cannot feed in facts and obtain mathematically correct diagnoses in return. But if a thorough examination is made, knowledge of fundamentals exercised, and, a calm reflection not tinctured with obsessions is brought to bear, and all evidences carefully weighed, the physician has done his full duty to his patient. Laziness enters in the cause of belated and incorrect diagnoses all too often. It is much easier to sit at the desk or bedside of the patient and ask a few questions, guess its malaria, write two prescriptions and tell the patient you will see him Friday, than it is to get a complete history make a thorough examination, and explain in detail to the patient how he must change his habits, regulate the diet, or whatever is necessary to correct the trouble present, in addition to any drugs that might be indicated. The medical profession is in a large measure responsible by reason of laziness and slipshod methods, for the existence of osteopaths, chiropractors, christian scientists and other cults.

In conclusion may I summarize some of the common faults in making an early and correct diagnosis. (1) Don't be too clever, mere cleverness is apt to be ineffective in most walks of life, and certainly it does not make a good diagnostician. For it is just when he

thinks himself most scientific that he is most likely to make a mistake. (2) Don't diagnose rareties. Remember the saying of that wise physician Samuel Gee, "common things most commonly occur." Doctor Gee, tells the story that he was once associated with a physician who had acquired a reputation in the diagnosis of unusual and rare cases. Although as a matter of fact, he was oftener wrong than right. They were going the rounds in the wards in his hospital one day when he pointed to sudden elevation of temperature in a chronic case of pulmonary disease and inquired its cause. Doctor Gee, replied that he believed it was due to the patient having developed an ischio rectal abscess, as he had a tender swelling in the usual situation. Well, he replied, I have seen an empyema point there. So when at a consultation you hear a doctor say, I once saw a case, etc., a bad diagnosis is most likely to occur. Cases so uncommon as only to be seen once are not likely to be seen again. (3) Don't be in a hurry. Wait until you have all the facts. Reserve your decision in a difficult case. If you come to a premature conclusion it is difficult to alter it afterwards, not only because it involves awkward explanations to the patient, but because, by the mere fact of having made a diagnosis you become insensibly biased and more impervious to the reception of fresh evidence. (4) Don't be faddy. This is the besetting sin of many physicians. He sees only what he is always seeing and what he wants to see. To the cardiologist few hearts are healthy. To the tuberculosis expert no lung is sound. The syphilographer sees disease only in terms of syphilis, the psycho-analyst only in those of sex. Try to see the case steadily and see it whole. (5) Don't mistake a label for a diagnosis, such a diagnosis as gastritis, neuritis, influenza, neurasthenia, are more often than not, mere labels; they have no essential relation to reality. It may be necessary in the exigencies of practice, and in order to satisfy the patient's mind, to use such labels for a time, but don't let them deceive you into thinking that you understand the nature of the case. Be mentally honest. (6) Don't diagnose two diseases simultaneously in the same patient. Remember the law of "Paucity of Causation." There is of course, no reason why patients should not run two diseases simultaneously, but as a matter of fact, they rarely do. Make it a rule, then, if you possibly can, to account for all the clinical features of the case by assuming the presence of only one pathological process. (7) Don't be too cock-sure. Think it possible as Cromwell said to the Scotch bigots, "that you may be mistaken." On the other hand, don't hesitate too long between too alternative diag-

noses. Cock-sureness in diagnosis is the vice of the careless and inexperienced; excessive caution that of the man who has seen too much. (8) Don't be biased. Avoid preconceptions. Approach every case with an open mind. Don't listen to the opinion of others, even that of the relation or nurse till you have formed your own. This is the main reason for consultations. The consultant approaches the case, or should do so, with an open mind. It is also the justification for the layman's desire, for an independent opinion, that is, for the opinion of one who is approaching the case fresh and without any preconceived ideas about it.

So let this somewhat rambling dissertation be a plea for a more thorough examination of our patients, the freeing of ourselves as far as possible from obsessions, the study of our mistakes and the constant effort to exercise honest unbiased judgment in drawing our diagnostic conclusions. Of course it is quite impossible that you should always be right in your diagnosis, if only for the reason that disease does not always play the game in the same way. But its better, however, to be wrong on sound principles than right by chance. Guessing is to be avoided at all costs; for if you once get into the habit of guessing you are diagnostically damned.

HYPEREMESIS IN TWIN PREGNANCY*

By W. T. McCONNELL, M. D., Louisville.

The theories regarding the etiology of nausea and vomiting associated with pregnancy are legion.

The chief contributing factors may be enumerated as follows: Dietary indiscretions, neurotic disturbances, endocrine dysfunction, abnormalities of the genital organs, constitutional disorders, biliary trouble, carbohydrate deficiency, actual or relative, unusual conditions of the ovum, such as hydramnios, multiple pregnancy, abnormalities of the chorion, etc.

The immediate cause of such disturbance is the presence in the blood stream of substances acting as toxic agents exerting a deleterious influence upon metabolism, with the resultant digestive disorders.

In the average case, the reserve forces are sufficient to adjust these difficulties in a few weeks, so that the patient will continue her pregnancy with a good degree of comfort and well being.

In some few cases the disturbing element is of such a severe nature that the maternal organism is not able to successfully combat these evil forces, the nausea and vomiting become more and more severe, until nothing is retained in the stomach. The patient becomes

dehydrated, emaciated, extremely neurotic, toxic and devitalized, the pulse becomes rapid, the skin is dry and parched, the temperature is elevated, the urine is scanty and concentrated, the intestine is inactive and epigastric pain is usually severe.

This extreme condition, fortunately, is not so common as formerly, due largely to better supervision of the patient, and more energetic efforts to correct the condition producing the ordinary vomiting of pregnancy. Few cases indeed need progress to the stage of hyperemesis gravidarum, if proper attention is paid to the earlier and milder forms of vomiting.

It has been shown by Paul Titus and others that in practically all of these cases, whether mild or severe, a marked carbohydrate disturbance is present. As soon as pregnancy is established, the carbohydrate needs of the mother are markedly increased. When the endocrines governing metabolism are able to care for this sudden need, there is no marked disturbance. When, however, the requirements develop more rapidly than the metabolic hormones are able to adjust themselves to the new conditions, digestive disturbances follow.

The developing placenta requires a great amount of glycogen, and the liver is called upon for an increased supply. In multiple pregnancy, the placenta area and volume being greatly increased a still larger demand is made upon the store of glycogen, and a greater tax is put upon the endocrines. If the metabolic forces are not able to supply the liver with sufficient sugar to insure an adequate glycogen reserve, hepatic degeneration results, and glycogen production falls, even below its ordinary level, and a vicious circle, is thereby established. The more the liver is damaged, the less glycogen is produced, and the more the glycogen reserve is depleted, the more liver damage ensues.

It is probably this sudden need that first throws the endocrines out of balance, and once disorganized, they in turn fall below ordinary efficiency.

Before this phenomenon was so well understood, the usual method of treatment of hyperemesis gravidarum was an early emptying of the uterus. This method of necessity sacrificed the fetus and frequently the mother, since by the time the disturbance progressed to the stage of actual hyperemesis, the maternal condition was such that the shock of abortion was sufficient to produce a fatal issue for the mother. The problem in the treatment of this condition, therefore, was to supply glucose to the maternal organism in such a form and in sufficient quantities, that the liver would have a chance to recuperate, the endocrines have opportunity to adjust their functions to the new requirements, the ma-

*Read before the Jefferson County Medical Society.

ternal organism would be adequately nourished, the dehydration combatted, and the fetal needs met.

The fact that the employment of such a system of treatment for hyperemesis is successful, both regarding mother and child, making therapeutic abortion seldom necessary, seems to prove its efficiency.

While various modifications in the technique are recommended by different operators yet the glucose treatment of hyperemesis has been developed to a point where the essential features form a common basis for these methods.

The case here reported is typical of the condition under consideration and the treatment employed.

Mrs. M. S. B., para 2, aged 37, was referred to me by Dr. Hermann on June 9, 1928. Examination showed patient to be dehydrated, dry, parched skin, heart rate 130, temperature 100° F., blood pressure 120-85, urine negative for sugar, albumin, casts or pus. She gave a history of having her last menstrual period three months previously (March 5), of becoming severely nauseated about three weeks ago, and for the last week being able to retain practically nothing by stomach. Complained of severe epigastric pain, sleeplessness, diplopia, pronounced weakness and prostration.

Vaginal examination revealed a much larger uterus than would be found in a three months' pregnancy.

Treatment: One ampule of corpus luteum was immediately given intravenously, with out any beneficial results.

She was removed to the Kentucky Baptist Hospital. Everything by mouth was discontinued. 1000 c. c. of 5% glucose in 1% saline was given intravenously, the administration being completed in 45 minutes. This was repeated daily for five days, when the urinary out put reached the amount of intake; four ounces of 10% glucose containing 60 grains of potassium bromide were instilled into the rectum every four hours.

The nausea and vomiting stopped immediately after the first injection of glucose; the abdominal pain ceased within 15 minutes; neither of these symptoms recurred.

On the third day some vaginal bleeding and cramps occurred, but subsided two days later. The diplopia disappeared about the seventh day. The pulse and temperature returned to normal on the third day.

From the third day fluids were given by mouth, at which time the rectal instillations were discontinued, and elixir bromidum and elixir luminol, of each drams one, were given by mouth three times daily. After the fifth injection of glucose the temperature rose to 102° F., and the pulse to 120, remaining thus for several hours, then returning to normal.

Soft diet was given after the fifth day, and regular diet on the seventh.

The patient left the hospital on the tenth day in good condition, with no recurrence of symptoms.

As pregnancy progressed, hydramnios developed so markedly that no diagnosis of position or presentation was possible by auscultation or palpation. On September 5, twin pregnancy was diagnosed by x-ray examination, showing about 7 months' pregnancy.

By November 1, the hydramnios had become so marked that the respiratory and circulatory embarrassment demanded interruption of pregnancy, and the patient was readmitted to hospital for delivery.

The babies were both female, weighed 4 lbs. 6 ozs, and 5 lbs. 6 ozs., respectively, apparently single-ovum twins, well developed and healthy. Mother and babies left the hospital in good condition, and today, more than six months later, are all thriving and well.

DISCUSSION

R. Alexander Bate: Dr. McConnell's report bears many points of interest.

Hirst as early as 1916 reasoned that the vomiting of pregnancy usually subsides as the corpus luteum reaches its acme of development. Hence a soluble extract of corpus luteum was used by him with eighty per cent of successes.

Hyperemesis in multipara has been comparatively rare in my observation.

Twin pregnancy in a primipara has not fallen to my lot; so I have seen no hyperemesis gravidarum in twin pregnancy. It is believed the chaperones of the corpus luteum inhibit menstruation. Hence the rational use of corpus luteum extract in cases attended with such hormone imbalance.

The liver and the parathyroid functions of the mother have likewise been called into questions of the metabolism of pregnancy. Very wisely I think.

The placenta of the fetus is also considered at fault in some cases.

Impaired hepatic function as well as extraneous placental toxins are best overcome, I believe, by the use of hepatic hormones.

Parathyroid is rational and has proven most useful in the extreme cases complicated by convulsions.

Sugar solutions meet such hormone imbalance as arises after the use of too much of the anti-diabetic or island of Langerhand's hormone. I have not been able to see its applicability as I have the other preparations yet as Dr. McConnell reports it seems quite popular. Suprarenal substance seems more rational.

Prenatal care, of course, eliminates the gross errors of diet.

If twins play any part in this case, the source would probably be placental. I thank the doctor for the pleasure of hearing the report.

Harry A. Davidson: Dr. McConnell has reported a very interesting case, and has given us the typical treatment of hyperemesis gravidarum. Titus, of Pittsburg, Penna., was probably one the first investigators to advocate this treatment, and has done more work along that line than any other man in this country.

As to corpus luteum: The doctor says he gave only one dose. I think that ought to be persisted in along with the glucose treatment. Corpus luteum is beneficial when administered either intravenously or subcutaneously, and this with the alkaline treatment and the glucose treatment, make the ideal treatment for pernicious vomiting of pregnancy.

I thank the doctor for his interesting case.

George A. Hendon: Some interesting experiences I have had may justify brief report. In the administration of sugar there are several things that may well be taken into consideration. It is surprising the enormous amount of glucose an individual can assimilate without any overflow in the urine. Woodyatt, in his experimental work, proved conclusively that an animal can assimilate as much as one gram of glucose for each three pounds of body weight every hour. This means that a person weighing 150 pounds can assimilate 50 grams of glucose or dextrose every hour. In my work in this connection I have found that individual resistance varies to an enormous degree concerning the amount of sugar that can be assimilated. I have allowed the appearance of sugar in the urine to be my guide as to the amount administered. As soon as the patient begins to show by the appearance of sugar in the urine that he is getting as much as he can assimilate I reduce the quantity. I have frequently given one pound a day for 5 or 6 days without any sugar appearing in the urine and the patients improved remarkably.

I think the rational method of giving sugar is the continuous administration, as in that way we do not impose a sudden burden on the system. I have found by continuous administration at the rate of a pound daily, given in 5000 to 6000 c. c. of sterile water or normal saline solution, no reaction is produced. The patient has no chills nor fever. The only time reaction occurs during the period of continuous administration is when we "milk" the tube. Sometimes the flow is apparently arrested and we squeeze the tube to increase the amount of fluid forced into the vein, then occasionally, but not always, the patient has a reaction. I think this is due to the fact that a sudden load is placed on the circulation at one time. I do not believe it rational or logical to introduce a "dose" of anything into the circulation. Of course, we know this has been done at times with very remarkable results. There is nothing I have said that can be construed as a criticism on Dr. McConnell's method of treatment in the case reported. His patient recovered, and it is the ultimate result which is after all, of the

greatest importance. Notwithstanding this, however, I believe that continuous administration is far superior to the intermittent method and can be used over an almost unlimited period of time.

L. Lyne Smith: Dr. McConnell has presented a very interesting report. As to the treatment of these cases by the intravenous administration of glucose. I read an interesting article in one of the medical journals a few weeks ago with reference to the treatment of the toxemia of pregnancy, in which it was stated that from 200 to 450 c. c. of a 15 per cent solution of glucose was given intravenously as a therapeutic measure. A blood sugar test was made before the glucose administration, and five minutes, thirty minutes, one hour and two hours afterward. When the difference between the blood sugar levels at thirty minutes and one hour is less than 50 milligrams, the prognosis is grave. When less than 40 milligrams, the case is hopeless.

W. T. McConnell, (in closing): I thank the gentlemen for their discussion. We do not know what effect corpus luteum has on metabolism, but it appears to stimulate glycogenic function. One ampule of corpus luteum was administered in the case reported, but no effect was noted from it.

I did not see the patient until she was in serious condition, and the administration of glucose was started shortly after she was admitted to the hospital. I did not consider it wise to continue giving corpus luteum, as it was evident something must be done quickly to save the woman's life. She had been vomiting almost continuously for more than three weeks, she was markedly dehydrated, she had fever and a very rapid pulse. Certainly corpus luteum would have been of little benefit under these circumstances.

The patient began to improve rapidly after the first administration of glucose solution. She had a rather marked reaction after the fifth dose. Possibly she might not have had this reaction had the glucose been given by the continuous method. I am very favorably impressed with what Dr. Hendon said concerning the advisability of continuous rather than intermittent glucose administrations.

The sugar curve was not estimated in this case. I have taken the sugar curve in quite a number of cases of toxemia of pregnancy, and found the sugar increased after one injection of glucose, sometimes, as much as 100 to 200 milligrams, without any apparent disturbance whatever and with marked increase in the urinary output. It has been shown definitely that convulsions of eclampsia occur when there is a sudden drop in the sugar content of the blood. It is not a question of how high or how low the individual's blood sugar level may be, but a sudden drop in the sugar content of the blood immediately precedes each eclamptic convulsion. My observations seem to indicate that toxemia causes con-

vulsions in pregnancy only when there is an over-supply of insulin in the blood stream. The introduction of sugar gives the insulin something to "work on," so to speak, and the patient is benefited both as to the toxemia and the convulsions.

I do not know how to explain the diplopia in the case reported. The visual disturbance persisted for about a week after the patient came under my observation and then disappeared.

SOME OF THE OLD TIME REMEDIES FOR TYPHOID FEVER*

By SMITH FIELD KEFFER, Grayson.

1. To begin with, when first called to a suspected typhoid patient, the Abbott theory of: "Clean out, Clean up, and Keep Clean," the entire intestinal tract as far as this is possible, was (and is yet in my opinion) a good way to begin treatment. No better method for the first three or four days exists than to use Calomel q. s. to produce from four to six stools in the twenty-four hours.

If after this preliminary treatment, diarrhoea persists, then the Sulphocarbolate of Zinc in 5 to 10 grain doses until it is controlled. Should there be no diarrhoea, then use Sulphocarbolate of Sodium instead of the Zinc.

2. If called to see a patient who has been ill for some time, with a dry coated tongue, then our old standby, Turpentine, 8 drops every 8 hours until secretions are aroused, with hot Turpentine stupes if any tympany exists, is in my opinion helpful. This together with sufficient enemas to unload all bowel accumulations, makes the patient more comfortable.

3. Should the temperature be so high that frequent bathing is necessary tepid water has always seemed better and certainly more agreeable to the sick one than cold, or icy baths. The cold or icy water per rectum, may be alright, but externally, it does not seem to me that it is ever indicated.

4. Then too, we should remember Quinine Sulfate in tonic doses, 3 or 4 times daily can not possibly do any harm, and may, and often proves to be of benefit.

5. Finally if we will always remember that a quiet room, a good bed, and a reliable nurse, are more necessary than any treatment we can give, and that drugs should only be employed as indicated, we can, I believe manage to restore most of our Typhoid patients to their former health, in due season.

6. Let us all adopt the slogan: "Every person in Kentucky, to have Typhoid vaccine, regularly, from at least age 10 to 30 years" and remove this menace to the health of our young people from the confines of our State.

*Read before the Carter Medical Society.

WOMAN'S AUXILIARY NOTES

SECRETARY'S REPORT FOR THE YEAR 1929

The Woman's Auxiliary to the Kentucky State Medical Association is glad to report a splendid year's work. We now have organized 23 counties with a membership of 561. Calloway county was organized in June with 14 charter members, and Graves county was reorganized about the same time.

The Executive board held a meeting in May at which time plans were made for the program of the annual meeting to be held at the Brown Hotel, in Louisville, Ky., October 21-24.

Every county Auxiliary has been notified of the scrap-book exhibition to be held at that time.

The Kentucky State scrap-book won the prize given by the President of the Southern Medical Auxiliary. The prize is a watch in a beautiful case making a clock which will be in use at the annual meeting.

PROGRAM OF SIXTH ANNUAL MEETING OF THE WOMAN'S AUXILIARY KENTUCKY STATE MEDICAL ASSOCIATION

Headquarters, Brown Hotel, Louisville

Monday, 3:30 P. M., October 21

Executive Board Meeting.

Monday, 9:00 P. M. October 21

Informal Conference to meet Mrs. Geo. H. Hoxie, President of the Woman's Auxiliary to the American Medical Association.

Tuesday, 10:00 A. M., October 22

Opening Session, Woman's Auxiliary

Presiding Officer... Mrs. J. T. Reddick, Paducah, President Woman's Auxiliary, Kentucky State Medical Association.

Invocation... Mrs. V. A. Stilley, Benton, Councilor, First District

Address of Welcome... Mayor Wm. B. Harrison, Louisville

Response to Address of Welcome... Mrs. Julian Estill, Lexington, Councilor Ninth District

Message from Kentucky State Medical Association... John H. Blackburn, Bowling Green, President.

Address—"Health Habits"... Granville S. Hanes, Louisville, President-Elect.

Address—"What a County Auxiliary Can Do" Mrs. J. P. Boggs, Hazard.

Tuesday, 1:00 P. M., October 22

Luncheon Meeting Pendennis Club

Address—"An Opportunity for Doctors' Wives—The Auxiliary"—Mrs. Geo. H. Hoxie, Kansas City, Missouri, President of the Woman's Auxiliary to the American Medical Association.

Tuesday, 7:30 P. M., October 22

Meeting with the Kentucky State Medical Association.

Oration in Medicine

"The Public's Obligation to the Medical Profession"... E. L. Gowdy, M. D., Campbellsville.

Oration in Surgery

"History of Orthopedic Surgery" (Illustrated) W. Barnett Owen, M. D., Louisville.

Wednesday, 9:30 A. M., October 23

Reports of Officers.

Reports of Committees.

Report of Historian, Mrs. W. F. Boggess, Louisville.

Report of Auxiliary of the American Medical Association, Mrs. Irvin Abell, Louisville, Fourth Vice-President of the Woman's Auxiliary of the American Medical Association.

Unfinished Business.

Report of Delegate to the Woman's Auxiliary of the American Medical Association..

.....Mrs. Hubert M. Meredith, Scottsville.
First Vice-President.

Report of Delegates to the Woman's Auxiliary of the Southern Medical Association..

.....Mrs. J. M. Sams, Crestwood,
Recording Secretary

Address—"The Extent of Our National Organization"—Mrs. A. T. McCormack, Louisville, Recording Secretary of the Woman's Auxiliary to the American Medical Association.

Address — "Kentucky's Mothers and Babies" Annie S. Veech, M. D., Louisville.

Installation of the President—

President's Address—"The Responsibility of Women for Good Health"...Mrs. P. E. Blackerby, Louisville.

New Business.

Election of Officers.

Round Table on the Future of the Auxiliary.

Wednesday, 7:30 P. M., October 23

Meeting With the Kentucky State Medical Association

Public Addresses.

The speakers will be Charles H. Mayo, M. D., Rochester, Minnesota and Morris Fishbein, M. D., Chicago, Illinois, Editor of the Journal of The American Medical Association.

Thursday, 10:00 A. M., October 24

Executive Board Meeting.

NEWS ITEMS

Dr. Arch Cox, 66 years old, died at his home at five o'clock, July 26, at Bardstown. He never recovered fully from an operation three years ago but was able to practice until two weeks ago. He was a member and former president of the Nelson County Medical Society.

BOOK REVIEWS

NEUROLOGICAL EXAMINATION—An exposition of tests with interpretation of signs and symptoms. By Charles A. McKendree, M. D., Associate, Department of Neurology, College of Physicians and Surgeons, Columbia University. With a foreword by Henry Alsop Riley, M. D. 12mo of 280 pages with 88 illustrations. Philadelphia and London. W. B. Saunders Company, 1928. Cloth, \$3.25 net.

The purpose of this book is to familiarize the medical student and those interested in post-graduate specialization with a comprehensive and systematic form of examination of the central nervous system. An attempt has been made not only to describe the various tests, but also to make it clear why such tests are applied, and to correlate abnormal findings with the symptoms expressed. The abnormal reactions are interpreted as pertinent pathological expressions of interference with anatomical relations and physiological functions, in such a way as to give to the student clinical pictures of pathology which he may readily understand and group under various syndromes.

No attempt is made to classify or describe disease pictures, but many important syndromes which have localizing value are described in connection with the tests applied.

AN INTRODUCTION TO THE STUDY OF PHYSICS (now for first time published) By William Heberden, (1701-1801). A prefatory essay by LeRoy Crummer. With reprint of Heberden's Some Account of a Disorder of the Breast. Portrait in photogravure. Six illustrations. Paul B. Hoeber, Inc., New York, publishers. Price, \$2.00.

This little volume is devoted to a collection of treatises by Heberden, which were found in a curio shop in London. It is a very interesting and fascinating story of the unpublished works of this interesting physician.

GARRISON'S HISTORY OF MEDICINE—By Fielding H. Garrison, A. B., M. D., Lieut.-Col. Medical Corps, U. S. Army, Surgeon General's Office, Washington, D. C., Octavo of 996 pages, with numerous portraits and other pictures. Cloth, \$12 net.

Every fact, every change in our knowledge, every important step in medical history has been examined, weighed, and if noteworthy, included in the *New (4th) Edition*. The valuable chronology of public hygiene and medicine has been greatly increased. So numerous and widely distributed were these additions that it was necessary to rest the entire book.

STATE BOARD OF HEALTH QUESTIONS AND ANSWERS, R. Max Goepp, M. D. Sixth Edition—thoroughly revised, Price \$6.00, W. B. Saunders Co., Philadelphia. This volume contains a comprehensive selection of State Board questions for medical examinations and should be of particular value to students preparing for medical board examinations and to physicians preparing for examination in reciprocity.

A MANUAL OF DISEASES OF THE NOSE, THROAT AND EAR.—By E. B. Gleason M. D., LL. D., Professor of Otolaryngology, Graduate School of the University of Pennsylvania. Sixth Edition, thoroughly revised. 12mo of 617 pages with 262 illustrations. Philadelphia and London: W. B. Saunders Company 1929. Cloth \$4.50 net.

The first edition of this manual was copyrighted in 1907 and the book has been many times reprinted between the various editions. In the early days of otolaryngology the writing of a small book that covered the subject fairly well was comparatively easy but became more difficult as the science progressed and new facts were discovered, so that the book became unavoidably somewhat larger with each edition.

The previous edition has been carefully revised and much of the text has been stricken out, sometimes because it was not in accord with the best modern teaching but oftener to make space for more important matter from the standpoint of a student or general practitioner. The formulas in the back of the book have been carefully revised and some new material has been added. Local anesthesia and biological therapeutics have received special consideration.

One of the reasons that render it difficult to write a small book is the difference of opinion among successful laryngologists as to the best method of treatment in even the more common pathological conditions. There are few operators who do tonsillectomies exactly alike. Probably the description in the text of three principal methods is the best manner of handling the subject. In so common a procedure as submucous resection of the nasal septum there is not so great a discrepancy except as regards packing and after treatment. For ethmoiditis there are many successful laryngologists who do only minor operating or practically none. Others usually resect the middle turbinate as a preliminary to nearly all operations on the ethmoids; while still another group prefer to preserve the middle turbinate wherever possible to guard against possible injury of the cribriform plate.

In the revision for the sixth edition careful

attention has been given to the criticisms of successful teachers of otolaryngology.

SURGICAL PATHOLOGY.—By William Boyd, M. D., Professor of Pathology, University of Manitoba, Winnipeg, Canada. Second Edition, Revised and Reset. Octavo of 933 pages, with 474 illustrations and 15 colored plates. Philadelphia and London. W. B. Saunders Company, March, 1929. Cloth, \$11.00 net.

The entire book has been reset. Whole sections have been rewritten, others have been recast, and extensive and important additions have been made to practically every chapter. There have been added 130 new illustrations.

To be more specific: The chapters on the thyroid and stomach have been rewritten, as have the sections on the etiology of tumors, including melanomata, lymphosarcoma, tumors of the testicle and of the kidney, carcinoid tumors of the appendix, and endometrial implants.

Another new chapter gives practical suggestions as to how the surgeon may utilize the assistance of the laboratory. The chapter on the spleen has been recast and includes Barcroft's physiological researches. The classification of the glioma group has been recast on the basis of Bailey and Cushing's work. The section on malignant tumors of bone has been rewritten, reflecting the new information obtained from the Registry of Bone Sarcoma of the American College of Surgeons. Among other new material may be mentioned Cadham's work on the treatment of septicemia, tissue cultures, precancerous lesions, carotid body tumors, tumors of the xanthoma group, pituitary tumors, diverticulosis and the pre-diverticular state, Wilkie's work on the etiology of chronic cholecystitis, Counsellor and McIndoe's work on hydrohepatosis, chronic serous arachnoiditis, etc.

INJECTION TREATMENT OF HEMORRHOID.—By Charles C. Miller, Modern Surgery Publications, Chicago, Publishers. A small compact volume giving in detail the history and technique of this form of procedure. The book is well illustrated and should prove valuable to those surgeons, who do this type of work.

CLINICAL ASPETSC OF VENOUS PRESSURE. By J. A. E. Eyser. The MacMillan Compnay, 60 Fifth Avenue, New York. Price \$2.50.

While important advances have been made in the knowledge and application of arterial blood pressure determinations in clinical medicine, the significance of venous pressure has been greatly neglected. This phase of pressure is the most direct indication that can be obtained clinically of the extent to which the heart is moving its load.

This volume describes in detail, the mechanics, of venous pressure in normal hearts and its relation to cardiac activity. It describes the technic and its value in cardiac disease and should be a valuable aid and guide to the general practitioner.

THE TREATMENT OF FRACTURES—By Lorenz Bohler, M. D., Chief Surgeon and Director of the Vienna Accident Hospital. Authorized English translation by M. E. Steinberg, M. S., M. D., Portland, Ore., 234 illustrations. Price \$5.00. Wilhelm Maudrich, Publishers, Vienna.

This book is an accumulation of nineteen years experience in more than 10,000 fractures and a study of about 70,000 roentgenograms and the dissection of more than 300 post-mortems performed chiefly during the war.

The book contains numerous original illustrations and is an invaluable aid and guide to those who treat fractures.

PARTNERSHIPS, COMBINATIONS AND ANTAGONISMS IN DISEASE.—By Edward C. B. Ibatson, M. D., (Lond), B. S. Fellow Royal Society of Medicine, London, Illustrated. F. A. Davis Company, Publishers, Philadelphia.

No other book having a similar subject title has appeared in English and throughout nature one meets with opposing forces and qualities, as light and darkness, heat and cold, positive and negative, normal growth and malignant growth.

This book deals with the partnership and antagonisms of diseases and is a valuable and interesting book for the practitioner.

TEXTBOOK OF CLINICAL NEUROLOGY. For students and practitioners. By M. Neustaedter, M. D., Ph. D. Visiting Neurologist, Central Neurological Hospital, Welfare Island; Formerly Lecturer in Neurology, University and Bellevue Hospital Medical College; Clinical Professor in Neurology, New York Polyclinic Medical School and Hospital;

Attending Neurologist, Bellevue Hospital, Outpatient Department, Stuyvesant Polyclinic, St. Mark's Hospital; Neurologist, Kings County and City Hospital, Welfare Island, New York. With an introduction by Edward D. Fisher, M. D., Professor Emeritus of Neurology, University and Bellevue Hospital Medical College, New York. With 228 illustrations, some in colors. F. A. Davis Company, Publishers, Philadelphia. Price \$6.00.

In studying this book the student and busy practitioner will acquire a working knowledge of the subject of neurology in as concise, lucid and complete manner, as the book was written not primarily for the neurologist, but for the general practitioner. The principal theme of this treatise is the semiology of the disorders of the nervous system, the symptom-complexes found at the bedside or in the consultation room, constitute the chapter divisions. This is a concisely written, valuable book.

THE HISTORY OF HEMOSTASIS.—By Samuel Clark Harvey, M. D., Professor of Surgery, Yale University, Surgeon-in-Chief New Haven Hospital. With 19 illustrations. Paul B. Hoeber, Inc., New York, Publishers.

A very fascinating book dealing with the story of the control of hemorrhage from the earliest dawn of surgery.

SPINAL ANESTHESIA, SUBARACHNOID RADICULAR CONDUCTION BLOCK. Principles and technique. By Charles H. Evans, M. D., Clinical Assistant, New York Post Graduate Medical School and Hospital. Introduction by W. W. Babcock, M. D., F. A. C. S. Foreword by C. G. Heyd, M. D., F. A. C. S. 41 illustrations, 3 in color and one folding colored plate. Paul B. Hoeber, Inc., New York, Publishers. Price \$5.50 net.

In this volume the author surveys the literature which has appeared on the subject and combines with it his personal experiences in order to stress the value of spinal anesthesia. He also shows that spinal anesthesia is safe but is also one of the most satisfactory of all forms of anesthesia for certain surgical procedures. The author has collected and abbreviated the results of a large amount of material that has been written in the last twenty-five years, making this book also an excellent summary of the material scattered through the specialties of medicine.

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COUNTY SOCIETY REPORTS

Nelson: At a meeting of the Nelson County Medical Association the following resolutions were unanimously adopted:

WHEREAS, the Supreme Dispenser of life and death has called from his earthly activities Dr. S. A. Cox,

Therefore, Be it Resolved that we recognize and deplore the loss of one who was faithful, skillful and untiring in the discharge of his professional duties, and,

Resolved, that we mourn the passing of Dr. S. A. Cox, who in his personal contacts was affable, courteous and intelligent, and,

Resolved, that we extend to his family our deepest sympathy and that a copy of these resolutions be sent to his family, to the Standard, The State Medical Journal and be spread on our minutes.

J. G. POWERS,
EDWARD D. MUDD,
J. J. WAKEFIELD,
R. H. GREENWELL.

Jefferson: The fall meeting of the Jefferson County Medical Society was held in the City Hospital on Monday evening, September 16th, 1929. The business session began at 7:45, after which, the following program was carried out:

Case reports were first given as follows:

Gasserian Ganglion with complications. By Dr. B. F. Zimmerman.

Infective Emboli with Purpura and Spontaneous Amputation of Foot. By J. G. Sherrill.

The essayist of the evening was Dr. H. E. Richey who read a paper entitled Spinal Anesthesia. General discussions followed.

A report of the committee on entertainment for the Kentucky State Medical Association was read. After which, the Society adjourned.

F. M. STITES, Secretary.

Franklin: The Society met in regular monthly session Thursday, August 1, 1929, at 12:00 noon, in the Writing Room of the Capital Hotel.

In the absence of Dr. John Patterson, the President and Dr. G. H. Heilman, the Vice-President, Dr. John P. Stewart, President-protem, called the society to order.

Members present were: Drs. Coleman, Stewart, Darnell, Jackson, Ginn, Budd, Travis and Minish.

Minutes of the July meeting were read and approved. In the absence of Dr. Coblin, who was to have had charge of the program, a general discussion of a whole time health unit for Frankfort and Franklin County was had, which resulted in a motion being made and seconded to endorse the creating of the unit. A committee composed of Drs. Budd, Coleman, Stewart and Travis were selected to take the matter up with the Fiscal Court.

E. T. MINISH, Secretary.



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15th Edition—2500 additional new words

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Re-edited by an editorial committee of the American Medical Association, under the direction of Dr. Morris Fishbein, editor of the *Journal*. A few of the 2500 *additional new words* follow:

abarognosis	bilivaccin	dechoin	estrin	hephephilia
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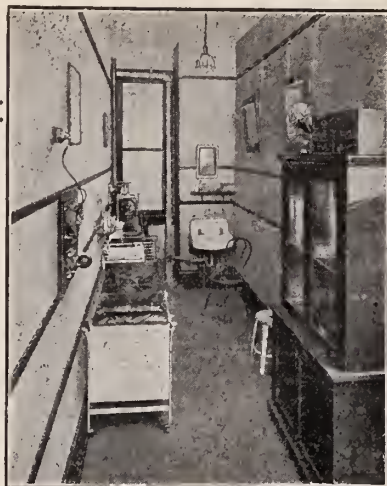
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Medical Director**

KENTUCKY MEDICAL JOURNAL

BEING THE JOURNAL OF THE KENTUCKY STATE MEDICAL ASSOCIATION

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EDITORIAL

SCARLET FEVER

In this issue we are presenting the most important scientific study that has ever been made by our State Board of Health. Dr. J. L. Jones, the State Epidemiologist, and Dr. L. H. South, Director of the Bureau of Bacteriology, in conjunction with Drs. Cowley and Armstrong of Berea and Dr. Gladys Dick of the Scarlet Fever Committee, Chicago, made a complete demonstration of the progress that has been made in the control of scarlet fever at Berea last spring. The details of this study are presented and merit the attentive consideration of every physician in the world.

This study fills the blank pages in the knowledge of scarlet fever and its value can only be appreciated by those who read and re-read every word of it thoughtfully. Here, we merely desire to emphasize the importance of the development of an accuracy and exactness in the technique of this important method for the prevention of scarlet fever, which will make it effective. Probably no other disease contributes, through its sequellae, more starting points for adolescent and adult diseases.

The plan which must be developed is for every physician to feel the responsibility for the immunization against diphtheria and the vaccination for small pox for every baby in his practice at the ninth month of age. Eventually, we are confident that a similar demand will be developed for immunization against scarlet fever at the end of the third year. If the profession will undertake to do these things, it will be the best possible method for the prevention of invasion of private practice by public agencies. Diseases, which are distinctly preventable, must be prevented. The public will be satisfied with no less and we, as a profession, must make our plans to answer this demand effectively.

We commend Dr. Jones' paper, which will be succeeded by similar studies made in Lexington and Clay in subsequent issues of the JOURNAL to the thoughtful consideration of our readers.

FAVORITE DRUGS AND COMBINATIONS OF DRUGS, ENTERING INTO THE PRESCRIPTION OF THE PRACTITIONER OF TWENTY-FIVE AND FIFTY YEARS AGO

In former years, when more attention was paid to the *Materia Medica* and when prescription writing was considered a finer art than it has become in these modern days of scientific investigation, every graduate in medicine was required to learn the *modus operandi* of drug action. The student left the college better equipped, the writer thinks, than he is today to satisfy the demand of the patient who, whether we agree or disagree in the propriety of his position, has inherited an age old faith and confidence in the curative power of medicines.

The physician of an earlier time depended upon certain remedies and combination of remedies in the meeting of the daily requirements of his practice. Unfortunately today, notwithstanding the fact that the treatment of disease is the final aim and end of all medical study, little time is assigned in the college curriculum to *Materia Medica*, the last several years seeing further decadence of interest in the teaching of physiological action and therapeutic application of drugs.

The subject has, however, not lacked for study elsewhere, very much of useful knowledge—especially concerning new drugs—having been added to the sum total of information, previously gathered almost wholly by the physician-pharmacologist. Today, we largely depend on the pharmaceutical house to supply us with additional information about drug action.

Among an unusually large galaxy of authorities, whose names graced the faculty of medical colleges, the writer recalls Wood, Hare, Bartholow, Shoemaker, Butler, Wilcox, Potter, Da Costa, Keyes and others. And among their contemporaries in foreign countries, constituting an equally noted group, are to be found the names of Trousseau, Fournier, Homolle, Brown-Sequard, Dujardin-Beaumez, Nativelle, Ringer, Virchow, Leyden, Klemperer, Salkowsky, Kimura and others.

In an effort to revive interest in a neglected field, in which these men were masters, at the request of the editor of the Journal, it is

proposed that the writer should review, in the months to come, certain basic, fundamental drugs, constituting a sheet anchor of reliance for our predecessors during the past twenty-five to fifty years.

Obtaining his diploma at a time when *Materia Medica* and *Therapeutics* were accounted the super-structure to which the physician turned for the relief of his patient, it is recalled that there was beginning then to creep into the mind of the new doctor the thought of therapeutic nihilism. The learned Osler was probably more responsible than any of his contemporaries for taking the student away from consideration of drugs. The writer recalls having heard this great clinician say, "Given a group of typhoids or a group of pneumonias, the percentage of recovery is about as great among those, who receive no medicine, as among those, who are given drugs."

And even more outspoken were the words of the noted Louisville surgeon-teacher, David Yandell: "You may puke a man, you may purge him; you may stimulate him, you may depress him; more than that is claimed by those, who believe in drug therapy, without being able to prove their contention."

The writer is not in accord with such pronouncement. He is convinced that from no inconsiderable number of drugs may be expected very satisfactory action and result, provided the user but understands how to select and apply the remedy.

Quinine will be discussed in the forthcoming issue of the *Journal*.

L. L. SOLOMON.

THE SOUTHERN MEDICAL ASSOCIATION ANNUAL MEETING AT MIAMI

The programs for the general, clinical and section meetings of the twenty-third meeting of the Southern Medical Association are being rapidly completed. They will stress the things which every physician needs to know every day, the small things and large things which help reduce the duration and intensity of illness. Tuesday, November 19, will be an unofficial day, a pre-meeting clinical day, with a splendid program by members of the Miami profession. On Wednesday, November 20, the general clinical program will begin, and the address of the President, Dr. Thomas W. Moore, of Hinton, West Virginia, will be heard that evening.

On Thursday and Friday, November 21 and 22, the sections will meet in half-day sessions. The programs contain the names of leaders in their various lines of work, not only from the Southern and Northern United States, but from Canada and Cuba. The American Society of Tropical Medicine is meeting this

year conjointly with the Southern Medical Association. Florida should furnish clinical material particularly suitable for study by this Society. The Southern Association of Anesthetists meets, as usual, conjointly with the Southern Medical Association, and the Atlantic Coast Line Surgeons Association will merge its annual meeting into the Section on Railway Surgery of the Southern Medical Association.

PRESIDENTS' NIGHT

Wednesday evening will be "Presidents' Night," when the presidents of three medical organizations will be heard: the President of the Southern Medical Association, Dr. Moore; the President-Elect of the American Medical Association, Dr. William Gerry Morgan, of Washington, D. C.; and the President of the *Circulo Medico de Cuba*, and Secretary of Sanitation of the Republic of Cuba, Dr. Francisco M. Fernandez. Dr. Fernandez is a member of the cabinet of the President of Cuba, and is head of all public health work in the Island of Cuba, where splendid work is being done under his direction. The Association is greatly honored by having him attend the Miami meeting and deliver this address.

There will be a public address Tuesday evening and the Orations on Medicine and Surgery will be given on Thursday evening.

SOCIAL FEATURES

Special entertainment such as only Miami can furnish is being arranged for the visiting physicians and ladies. The President's reception and grand ball will be at the Coral Gables Country Club, one of the most beautiful country clubs in the world, on Wednesday evening immediately after the general session. There will be dancing in the lovely outdoor pavilion. Another unique and delightful entertainment, a beach party at Miami Beach, will be given on Tuesday afternoon and early evening. The alumni reunions will be in the form of smokers on Thursday evening following the general session.

SPORTS

The golf tournaments for men, with handicap and without handicap, will be played at the Miami Country Club, with no greens fee and at the convenience of the players up to Thursday noon. The ladies tournament will be played at the Miami Beach Municipal Golf Course, with no greens fee, Thursday forenoon. Other golf courses open are the Coral Gables Golf and Country Club, Country Club Estates Course, and the Miami Biltmore Club with small greens fees. In addition to the two permanent trophies of the tournament, the Washington Post and the Dallas Morning News Cups, the Local Committee will offer four prizes for the men and four for the ladies. There will be the usual trap shooting tournament, the time and place not yet de-

terminated.

Miami is a fisherman's paradise, and the best game fishing available to Americans is off its coast. The balmy weather of November will permit surf bathing and all forms of water sports. There is also good hunting in the vicinity.

TRAVELING ARRANGEMENTS

Through sleepers with reduced railroad rates are available from all points in the South to Miami. special train, the "President's Special," has been announced. Florida's splendid hard-surfaced roads make a trip by automobile easy, and Florida can be seen at its best by automobile. A tour from New Orleans to Miami is being arranged, which will go by steamer from New Orleans to Tampa, and from Tampa to Miami by bus. The Medical Association of Georgia, of which Dr. William R. Dancy, of Savannah, is President, is featuring a "President's Tour," a motorcade from Savannah to Miami, and physicians from other states are invited to join it.

Those who motor will see the most beautiful parts of Florida. They should make every effort to go through the Ridge Section, and to see the Bok Memorial Tower and Sanctuary at Lake Wales, in the heart of the ridge section. The Bok Tower, on the highest point in Florida, is worth driving many miles to see. It is especially lovely when its marvelous chimes are playing.

HOTELS

Miami is noted for its beautiful and commodious hotels. Five of the largest and finest are close together on Biscayne Boulevard, across from the city park, overlooking Biscayne Bay and the Atlantic Ocean. Guaranteed rates are \$3.00 to \$5.00 per day for single rooms and \$5.00 to \$8.00 for double rooms.

CUBA

"After Miami, Cuba." To climax an already delightful occasion the Association has arranged an official all-expense post-convention tour to Cuba under the direction of the Secretary-Manager. Few will again have this propitious opportunity to see Havana and Cuba at so low a cost under such delightful circumstances. Those who visit Cuba are invited by Dr. Fernandez, Secretary of Sanitation, to be his guests for a luncheon in Havana.

Miami and Florida never lose their charm. "There is no place in the world that compares with Miami as a resort center," says a retired business man of Chicago.

The great interest of medicine lies in its ever changing character; the physician can never handle his cases perfectly, but he can each year estimate what his fellow practitioners have evolved, which will improve his own methods of practice.

THE LOUISVILLE MEETING

Just as we are going to press, one of the most successful meetings ever held by the Kentucky State Medical Association closed, and it will be described in full detail in the next issue of the JOURNAL. The program ended Thursday at 5:00 o'clock, and at that time, 300 doctors stood up at the sound of the gavel, when they adjourned sine die. This was a most unprecedented record of attendance the last day in the history of the Association. From the time the House of Delegates met, Monday afternoon, until the closing, there was always a crowded hall. The following officers were elected:

President—Granville S. Hanes, Louisville.

President-Elect—W. B. McClure, Lexington.

Vice-Presidents—J. M. Phythian, Newport; L. S. Hays, Louisa; W. E. Gary, Hopkinsville.

Secretary—A. T. McCormack, Louisville.

Treasurer—Marshall McDowell, Cynthiana.

Delegates to the American Medical Association—George A. Hendon, Louisville; Irvin Abell, Louisville; A. T. McCormack, Louisville.

Orator in Surgery—Owsley Grant, Louisville.

Orator in Medicine—E. F. Horine, Louisville.

MIAMI HOTELS

If one writes to the hotel of his choice and does not hear within a reasonable time, or that particular hotel has reservations to its capacity, write to Dr. Bascom H. Palmer, Jr., Huntington Building, Miami, Fla., who is Chairman of the Committee on Hotels. He and his committee will take great pleasure in seeing that comfortable accommodations are arranged for all who desire to attend the Miami meeting. In writing either to the hotel or Dr. Palmer, state the kind and price of accommodations desired, the day the reservation is to become effective, and if possible give the time of day the reservation is to begin.

The first five hotels, the McAllister, Columbus, Watson, Everglades and Alcazar, are on Biscayne Boulevard overlooking Miami's lovely tropical park and beautiful Biscayne Bay. The McAllister Hotel is now booked to capacity (9-30-1929).

McAllister Hotel (General Hotel Headquarters). Single room with bath, \$4.00 and \$5.00. Double room with bath (twin beds), \$8.00.

Columbus Hotel (Headquarters for American Society of Tropical Medicine and Southern Association of Anesthetists). Single room with bath, \$4.00 and \$5.00. Double room with bath, \$6.00, \$7.00, \$8.00.

ORIGINAL ARTICLES

A PRACTICAL DEMONSTRATION IN THE CONTROL OF SCARLET FEVER

By J. L. JONES, Louisville, and JOHN W. ARMSTRONG, Berea.

In March 1929 an epidemic of scarlet fever occurred at Berea College, Berea, Kentucky. The incidence of an outbreak of such proportions in an adult population, together with the study and control program that was carried out, make it of general interest.

Berea is an agricultural community with a population of about 1,600. The students, faculty and workers of Berea College number over 2,200. Most of the workers, part of the faculty and about 100 students live off the campus. The others live in various campus dormitories. The students are largely drawn from mountain sections of Kentucky and surrounding states. Two large boarding halls, each with its own kitchen and several dining rooms, are maintained for students. The school has an independent water supply, provided through an impounding reservoir. The milk supply is largely from the college herd and up until the time of the epidemic was being used raw. A small amount of raw milk obtained from the outside is pasteurized at the college. The college hospital, with its isolation annex for communicable diseases, cares for sick students. Medical service is provided by a staff of three physicians.

During February and the early part of March, 12 students with scarlet fever were admitted to the college hospital as follows:

February 9—1 case	March 4—1 case
February 13—1 case	March 5—1 case
February 27—2 cases	March 7—3 cases
February 28—1 case	March 8—1 case
March 11—1 case	

All of these patients had the characteristic scarlatinal rash followed by desquamation.

The prevalence of many mild, unrecognized cases during this time became apparent later on, upon questioning the student body in relation to the occurrence of symptoms characteristic of scarlet fever, and finding that a large number gave a history of having been ill with sore throat, associated in a majority of instances with headache, and either nausea or vomiting or both. A few of these students had reported at the out-patient clinic for treatment, but in the absence of a recognizable rash at the time they were seen, it was thought to be tonsillitis.

On March 12, there were 94 admissions to the hospital. Each case had sore throat, head-

ache, malaise, and some degree of fever. All throats had a similar appearance, scarlet areh of fauces and an exudate over the tonsils. In a few instances the throat picture was modified by a superimposed Vincent's angina.

The State Board of Health was promptly notified and representatives of the Board, in co-operation with the Medical Staff of the college, immediately started an investigation.

On March 13, 80 more similar cases were admitted to the hospital. In view of such mass infection it seemed apparent that this epidemic was milk borne but at first it was thought to be one of septic sore throat, and control measures were instituted on this basis. Pasteurization of all milk was immediately ordered and all utensils in the dining halls were either renewed or sterilized. The water supply was checked and found safe and of good quality. Each of the 50 cows of the college herd was examined and found free of disease and samples of milk from each cow were analyzed and found free from pathogenic organisms. Nose and throat cultures were taken on all food handlers and those working in the dairy. Several carriers of hemolytic streptococci were found among students working in the boarding halls.

On the second day of the epidemic, that is March 13, rashes began to appear in a few cases admitted the day before. In several instances scarlet fever antitoxin was injected intradermally at the site of the rash, and typical blanching occurred (Schultz Charlton reaction) showing that we were dealing with scarlet fever. This suggested that in all probability all the cases must be scarlet fever. This view was further supported by the knowledge we had of previous scarlet fever infection at the college, as mentioned above. Cultures from the throats of a few patients were taken on blood agar plates and hemolytic streptococci found. This was consistent with either scarlet fever or septic sore throat, however, the mild nature of the disease and also the throat picture were far more characteristic of the former than of the latter.

During the next three days, 147 additional cases were admitted to the hospital after which there was a marked decline. Rashes continued to appear but in only a small percentage of the patients, as considered later.

In all probability all cases up until March 12, when the explosive outbreak occurred, were contact infections. The sudden appearance of 94 cases March 12 with 80, 58, 60 and 29 the following days respectively and then a sudden drop to an average of 4 cases a day for the following week, strongly suggested the occurrence of a milk borne outbreak superimposed upon contact infection. This appeared all the more evident when it was learned that practically all of the cases which de-

veloped between March 12 and 16 had been eating at one of the two boarding halls. Although the exact source was never determined, it seems reasonable to conclude that milk had been contaminated after reaching the hall by either an unrecognized case or carrier. A probable clew to such a source was indicated upon finding several of the waiters in the hall, carriers of hemolytic streptococci.

Confronted then with a wide-spread outbreak of scarlet fever, the problem presented itself as to how it could be most effectively controlled. Up until this time we had been accustomed here in Kentucky, as is the case in so many places, to depend almost wholly on quarantine and isolation, realizing all the while, however, that such control measures were wholly inadequate. At the time we had a limited knowledge of passive and active immunization against this disease but we were quite unconvinced of its efficacy.

At any rate it was recognized that here was a situation demanding the best advice available. In this connection we were very fortunate in securing the services of Doctor Gladys H. Dick, of Chicago, who came to Berea and advised and assisted us in carrying out a modern, scientific program in the control of scarlet fever.

In outlining a plan of action various procedures were discussed and of course considered in the light of local conditions. A number of practical difficulties presented themselves. The college dairy is largely run by students; the dining halls and kitchens are maintained through student help; Boone Tavern, a modern hostelry, conducted by the school and well patronized by the traveling public employs little help outside the student body; students also conduct a bakery, which serves the public as well as the school; because of the boarding hall situation large aggregations could not be prevented; as mentioned earlier, a small percentage of the school population lived off the campus.

Among the more important questions which naturally arose were the following: Should the school be closed? This was deemed irrational because of the danger of spreading infection when the students returned to their homes. Should classes be discontinued for a time? No purpose was seen in this, since aggregation in dormitories and dining halls could not be avoided. Furthermore, it was felt that students would be under better observation and control in their usual activities. Should Boone Tavern and the bakery be closed? Certainly this should have been done had it not been possible to do skin tests to determine susceptibles and take nose and throat cultures to determine carriers and infected individuals. However, with the carrying out of these measures, thus enabling us

to employ immune persons who were not carriers, in these places, it was felt that they could be kept open without constituting a potential danger to the public. The same procedures were carried out among the workers in the dairy, dining halls and kitchens. Should passive immunization of all susceptibles with scarlet fever antitoxin be carried out? It was recognized that this would promptly check the epidemic temporarily, but with such immunity disappearing in the course of ten days or two weeks, at the end of that time we would be in essentially the same position as we started, with the prospect of the epidemic lighting up again through contact of susceptibles with the large number of "carriers" which it was anticipated would inevitably be present among the student body. Also the susceptible group would be sensitized to serum. What objection is there to passive immunization for immediate control, followed in due time by active immunization for more permanent protection? This might be looked upon as quite the ideal plan, however, certain drawbacks and disadvantages are recognized. First, there is the added expense and in most instances an unnecessary expense, since in a large majority of susceptible individuals protection would result from active immunization before infection took place. That is to say, comparatively few contacts become infected and contract scarlet fever on any single exposure. Second, sensitization to serum would result, and third, there is always the difficulty of carrying out both procedures, as there is no assurance that the persons concerned will report for active immunization after being passively immunized and hence the opportunity of conferring a more lasting immunity may be lost. In case the skin test is positive, indicating susceptibility to scarlet fever and the nose or throat culture is positive for hemolytic streptococci, indicating potential infection, then prophylactic antitoxin should be given immediately and followed in due time by active immunization, however, where nose and throat cultures are negative, antitoxin does not seem justified.

After due consideration of all aspects of our problem, the following general program of control was decided upon:

- (1) Isolation of all cases, either in the college hospital or in dormitories set aside for that purpose.

- (2) Campus quarantine of all persons connected with the college, based on the results of nose and throat cultures taken on blood agar plates.

- (3) Skin tests (Dick Test) on all persons connected with the college to detect susceptibles to scarlet fever.

- (4) Active immunization of susceptible persons with five graduated doses of scarlet

fever toxin.

ETIOLOGY; TOXIN, ANTITOXIN; CARRIERS.

It is not our purpose in this paper to review the scarlet fever literature, but in order to better understand and more fully appreciate the logic and rationale of the program carried out at Berea College, it seemed advisable to include a brief statement of some of the more outstanding developments which have laid the foundation for our present practices in the control of scarlet fever.

It has long been suspected that some form of streptococcus was the cause of scarlet fever because of the constant association of this organism with cases of this disease. Through the work of Moser and Pirquet,¹ Rossiwall and Sechick,² Ruediger,³ Dochez,⁴ Dochez and Bliss,⁵ Tunnell,⁶ and others, it has been shown that the streptococci recovered from scarlet fever patients belonged for the most part to the same serological grouping, however, the agglutination test has not proven to be a reliable means of identifying scarlet fever streptococci.

In 1902 Moser described the use of his antistreptococcal serum in the treatment of scarlet fever. He immunized horses with the living cultures of streptococci, cultivated from the heart's blood of fatal cases of scarlet fever. In 1905, Gabritschewsky,⁷ a Russian investigator, introduced a vaccine for the prevention of scarlet fever. This was prepared from broth cultures of strains of streptococci isolated from cases of scarlet fever. The irregularity of results obtained with these preparations, suggested that at times the cultures employed contained a factor which was absent from other cultures used, and the factor was believed by some to be a filtrable virus.

In 1923 and 1924, George F. and Gladys H. Dick,⁸ of Chicago, reported the successful transmission of scarlet fever to human beings by inoculating the tonsils and pharynx with pure cultures of hemolytic streptococci isolated from cases of scarlet fever. The streptococci used in these experiments fulfilled all the requirements of Koch's laws and hence it was concluded that they were the cause of scarlet fever and not some associated filtrable virus.

At the present time the scarlet fever streptococci are regarded as only one part of the larger grouping of "Hemolytic streptococci," from which they can be distinguished only by a study of toxin production and other biological tests, the technique of this differentiation as yet not being sufficiently simple to allow of its routine use in diagnostic laboratories.

In 1918 Schultz and Charlton,⁹ described the phenomenon now known as the Schultz-Charlton reaction. It consists of a local

blanching of the scarlatin rash about the site of an intracutaneous injection of convalescent scarlet fever serum. This test may be used in the diagnosis of scarlet fever rashes, using either convalescent serum or scarlet fever antitoxin. In 1923, Mair,¹⁰ published his results with the Schultz-Charlton reaction, and concluded that this reaction is definite experimental evidence of a toxin antitoxin phenomenon in scarlet fever.

In 1924 the Dicks¹¹ reported the discovery of a specific toxin. This toxin was found in filtrates obtained from cultures of the hemolytic streptococci that had produced scarlet fever in human beings. When suitable amounts of this sterile toxin were injected into susceptible persons it was found capable of producing all of the characteristic symptoms of scarlet fever including the rash. They found that the toxin is neutralized by convalescent blood serum, due to the presence of an antitoxin in the blood of recovered patients. If persons susceptible to scarlet fever are immunized by injections of small doses of the toxin, their blood serum acquires similar antitoxic properties. These findings together with the negative skin reactions in convalescent scarlet fever patients, the positive reaction in persons susceptible to the disease and the beneficial action in scarlet fever of the antitoxin obtained by immunizing horses with sterile toxin, proved that they were dealing with a true soluble toxin, specific for scarlet fever.

After demonstration of the specific toxin, Dick and Dick,¹² found that weak solutions of the toxin may be employed in skin tests to determine susceptibility to scarlet fever. When this toxin was injected into persons who had not had scarlet fever it was followed by a local inflammatory reaction, whereas, in persons recently recovered from this disease there was no reaction. Pursuing this line of investigation they developed the so-called "Dick Test."

Following the work of Dick and Dick, Zinger¹³ and Branch and Edwards,¹⁴ studied the relation of the Dick test to scarlet fever and reached the same conclusion as had the Dicks, namely, that the skin test with scarlet fever toxin bears a specific relation to immunity to scarlet fever. This test is now looked upon as a reliable clinical test to determine whether a person is susceptible or immune to scarlet fever.

Scarlet fever toxin is obtained by growing the streptococci in special broth cultures, 4-6 days, filtering through Berkefeld filters, aging, diluting and carefully standardizing. Toxin is standardized by determining that dilution in which 0.1 cc injected intracutaneously into a susceptible person will give a positive reaction of the same size and intensity

as the reaction obtained with a standard skin test dose of toxin in the same individual. This amount is termed the "Skin Test Dose" (Dick).

The active immunization of human beings by means of injections of graduated doses of toxin has only recently been placed upon a rational basis by the work of the Dicks.¹⁵ These investigators have shown that if properly graduated doses of scarlet fever toxin are injected at intervals of 5-7 days, it is possible to actively immunize, without undesirable results, all susceptible persons, so that their skin tests become negative, and they do not contract scarlet fever on exposure.

With the discovery of the scarlet fever streptococci and the demonstration of the toxin in blood broth filtrates, it has become possible to produce an antitoxin in horses in a manner similar to that in diphtheria. The antitoxin is standardized in terms of toxin. The Dicks state that any antitoxin used should be of such strength that 1 cc of the concentrated serum will neutralize 15,000 skin test doses of toxin.

It has been shown that concentrated scarlet fever antitoxin, injected intramuscularly, rapidly relieves the toxic symptoms of the disease, shortens the course, diminishes complications and reduces the mortality.

The agency of "carriers" in scarlet fever has been demonstrated repeatedly, by the taking of nose and throat cultures on blood agar plates. When scarlet fever streptococci are present, typical colony formation, with its characteristic hemolysis, results. Through the application of this procedure it has been learned that in any group or population where scarlet fever is prevalent, there is invariably a high percentage of carriers.

These carriers consist of:

(1) The "missed cases," viz, those persons who are suffering from scarlatinal sore throat alone, without a recognized eruption, and who are not sick enough to go to bed or, possibly, even complain of their symptoms.

(2) The convalescent "carrier," the individual who continues to harbor the infection in his nose and throat for a long time after apparent recovery.

(3) The immune "carrier," the person who has had scarlet fever sometime previously or else has been artificially immunized against it, but because of recent contact with a case or carrier, scarlet fever streptococci have lodged in his nose or throat.

Such persons play an important part in spreading scarlet fever.

CONTROL PROGRAM AT BEREA

Skin tests were done and nose and throat cultures taken on the entire population at Berea College, both procedures being carried out at the same time. The following sketch shows the set up that was used:

- NURSE
- | | | | | | |
|----|---|---|---|---|----|
| 1 | 2 | 3 | 5 | 7 | 8 |
| 09 | | 4 | 6 | | 09 |
- (1) Table with soap, water, towels, cotton, alcohol for cleansing arms.
 - (2) Table with clerk checking names, taking histories and giving out cards.
 - (3) Table with sterilizer, toxin, syringes and needles.
 - (4) Doctor injecting toxin for skin test.
 - (5) Table with tongue blades, sterile swabs and blood agar plates.
 - (6) Doctor taking smears from nose and throat.
 - (7) Technician plating the swabs.
 - (8) Table for stacking finished plates.
 - (9) Waste cans.

NOSE AND THROAT CULTURES

The technique of preparing blood agar plates together with the description of other laboratory procedures, necessary in culturing for hemolytic streptococci, are taken up in a separate article by Doctor Lillian H. South and E. H. Sandlin.

After the blood agar plates are prepared, the bottom of each is marked into halves, one side being used for nose and the other for throat cultures, and designated by an "N" and "T" respectively. A sterile swab is wiped over each tonsil or fossa and also applied to the region behind the uvula after which it is streaked on the "T" half of plate. Each nostril is then swabbed with a second applicator and spread over "N" half of plate. In taking nose cultures the swabbing should extend well back toward the posterior nares. In streaking the plate a rotary movement of the applicator is necessary to assure contact with all surfaces. The number corresponding to that on the individual's card is written on the top of plate cover with wax pencil or otherwise. The cultures are incubated at 37 degrees for 18 to 24 hours and then read for growth of hemolytic streptococci.

The culture readings are classified according to the amount of hemolytic streptococcus colony formation and designated as follows:

Negative—No recognizable hemolytic streptococcus colonies.

One Plus—Characteristic hemolysis up to one fourth of area inoculated.

Two Plus—Characteristic hemolysis of from one-fourth to one-half of area inoculated.

Three Plus—Characteristic hemolysis of from one-half to three-fourths of area inoculated.

Four Plus—Characteristic hemolysis of three-fourths or more of area inoculated.

The results of nose and throat cultures are shown in Tables 1 to 5, inclusive.

As shown in Table 1, nose and throat cultures were made on 2,232 persons, 834, or 37.4 per cent of whom were positive. However, of the 834, 350 were in the hospital with scarlet fever, that is, all of the patients with scarlet fever, regardless of how mild their symptoms were, had positive cultures. Leaving this group out of consideration there remained 1,882 on whom cultures were taken, 484 or 25.7 per cent being positive. It is known as mentioned earlier, that a certain indefinite percentage of these 484 individuals had recently had mild, unrecognized cases of scarlet fever but just how many was never known. This makes it impossible to say just what percentage of this group was immune carriers who had not recently had scarlet fever and what percentage was convalescent carriers.

TABLE I.

Results of Nose and Throat Cultures

Positive Cultures		Negative Cultures		Total	
Number	Percent	Number	Percent	Number	Percent
834	37.4	1,398	62.6	2,232	100

In this series very few positive cultures were obtained from the nose, and all persons with positive nose cultures also had positive throats. In a majority of cases with positive nose cultures a history of sinus infection was obtained and in practically all instances these were the individuals in whom the carrier condition was last to disappear.

In order to interpret more intelligently the results of nose and throat cultures as well as the results of skin tests, in terms of age distribution, degree of contact and other factors, it was thought advisable to divide the college population into the several groups as indicated in Table II.

TABLE II.

Results of Cultures in Relation to the Different College Groups.

Groups	Age Limits	Pos. Cultures		Neg. Cultures		Total	
		No.	Pct.	No.	Pct.	No.	Pct.
Students	16-30	405	31	901	69	1,306	100
Faculty	25-60	21	10.5	178	89.5	199	100
Faculty Wives	21-55	5	10.2	44	89.8	49	100
Faculty Children	2-5	3	8.3	33	91.7	36	100
Training School	6-14	31	23.6	100	76.4	131	100
Emergency Workers	20-50	8	9.1	80	80.9	88	100
Nurses	18-30	4	30.7	9	69.3	13	100
Outsiders	10-50	7	11.7	53	88.3	60	100
Total		484	25.7	1,398	74.3	1,882	100

The training school students are elementary grade school children, 6 to 14 years of age, from town and faculty homes. This department is maintained by the college to provide

practice teaching for certain students.. The emergency workers are employed in various industrial departments of the school. In the group designated as "outsiders" is included a number of visiting physicians, several emergency nurses, a few tourists temporarily visiting at Boone Tavern, and a number of the residents of Berea, chiefly business people, who had been in more or less direct contact with the students.

The 350 hospitalized cases of scarlet fever are not included in Table II. It should be mentioned, however, that all of these cases were in students. From this table it is seen that the largest percentage of positive cultures was among the student group, with the nurses coming second and the training school third. These are the groups among which association with cases was most intimate. The percentage of carriers among the faculty seemed rather small in view of the more or less wide spread association with students, however, this contact was not so intimate as was the case with the above mentioned groups. It seems reasonable to assume that a great many carriers among the student group resulted from the same source, which had apparently been responsible for the explosive outbreak of cases, namely, a contaminated milk supply in the one dining hall.

In column two of Table II. is shown the age limits of the different groups. Whether or not age has any bearing on the problem of scarlet fever carriers is not known.

As mentioned above the positive plates were interpreted as 1 plus, 2 plus, 3 plus, and 4 plus, depending on the amount of streptococcus colony formation with its characteristic hemolysis. Table III. shows the number and percentage of cultures in each of these groups.

TABLE III.

Positive Cultures in Relation to the Amount of Hemolytic Streptococcus Colony Formation

4 Plus		3 Plus		2 Plus		1 Plus		Total	
No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
647	76.5	68	9.5	55	5.1	64	8.9	834	100

Of the 834 positive cultures which included the 350 hospital cases, 647, or 76.5 per cent were read as 4 plus, indicating that in a large majority of the individuals with positive cultures, the throat contamination was heavy. Practically all of the 350 cases of scarlet fever were in the 4 plus group. Nine and one-half per cent of the positive cultures were read as 3 plus, a little over 5 per cent as 2 plus and 8.9 per cent as 1 plus.

Cultures were also interpreted in terms of skin tests. This is shown in Table IV and V. In Table IV positive cultures are shown in relation to positive and negative skin tests for each of the college groups.

TABLE IV.
Positive Cultures in Relation to Skin Tests

Groups	Neg. S. Tests		Pos. S. Tests		Total	
	No.	Pct.	No.	Pct.	No.	Pct.
Students	653	86.1	100	13.9	753	100
Faculty	16	76.2	5	23.8	21	100
Faculty Wives	4	80	1	20	5	100
Faculty Children	0	0	3	100	3	100
Training School	11	35.5	20	64.5	31	100
Emergency Workers	6	75	2	25	8	100
Nurses	4	100	0	0	4	100
Outsiders	6	85.7	1	14.3	7	100
Totals	702	84.2	132	15.8	834	100

Of the 834 positive cultures, 702 or 84.2 per cent were in persons with negative skin tests. However, included in the 702 are the 350 hospital cases, all of whom had negative skin tests. There were 132 persons with positive cultures who had positive skin tests. This may seem rather surprising, indicating as it does that this number of susceptible persons were actually harboring scarlet fever streptococci in their throats. Several questions present themselves in this connection. Will all of these individuals develop clinical scarlet fever? Whether or not this happens, according to Doctor Dick, depends on the balance between the immunity of the individual and the dosage of the organism present. As will be pointed out later, positive skin tests vary in size and degree of redness depending on the degree of susceptibility. That is, some persons may have a slightly positive reaction indicating considerable immunity while others have a marked reaction indicating very little immunity. Therefore, whether a person with scarlet fever streptococci in the throat develops scarlet fever or not depends on whether or not the dosage present is sufficient to overcome the immunity present. Will the presence of scarlet fever streptococci in the throats of susceptible persons who do not develop scarlet fever confer additional immunity? This is answered in the affirmative by Doctor Dick. In many of such cases a mild sore throat, with no other symptoms, will develop, due to the presence of these organisms. In a number of instances it has been shown that individuals may have several of such attacks, by virtue of which complete immunity results. In our series 139 hospitalized cases with positive throat cultures, but who had had no symptoms other than a mild sore throat, were found to have negative skin tests, indicating the completion of immunity. No check was

made as to the immunity conferred by the presence of hemolytic streptococci in the throats of the 132 persons with positive skin tests, since they were all given immunizing toxin, as described later.

In order to more fully appreciate the significance of the figures in Table IV for the different college groups, they should be compared with those in Table VI which shows the total number and percentage of positive and negative skin tests in each of these groups, regardless of whether their cultures were positive or negative.

With the exception of the faculty children and the training school, the relation of cultures to skin tests did not vary materially between the different groups, being more or less proportional to the total number of positive skin tests in these groups. The high percentage of positive cultures among those with positive skin tests in faculty and training school children is not surprising in view of the high percentage of positive skin tests in these groups, as shown in Table VI. It is rather surprising, however, that no clinical symptoms of scarlet fever developed in either of these groups. This indicates that although scarlet fever organisms were present in their nose or throat yet they possessed sufficient immunity to prevent infection with the dosage present.

Since none of the nurses had positive skin tests, all of the positive cultures were in those with negative tests.

Table V shows the results of cultures interpreted as 1 plus, 2 plus, 3 plus, and 4 plus, in relation to skin tests.

Of the 702 with negative skin tests and positive cultures, 548 or 78 per cent had four plus culture readings, but again, this includes practically all of the 350 hospital cases. Of the 132 with positive skin tests and positive cultures, 99 or 75 per cent had four plus culture readings, while over 11 per cent had three plus plates. This indicates rather heavy throat contamination in a large group of susceptible persons. With such heavy dosage present one would naturally expect a majority of these persons to develop scarlet fever. As a matter of fact but 54 cases developed among this group, subsequent to skin testing and culturing, while nine cases developed among the group that had positive skin tests and negative cultures at the time of first culturing.

TABLE V
Cultures Interpreted as One plus, Two plus, Three plus and Four plus, in Relation to Skin Tests.

Skin Tests	4 Plus		3 Plus		2 Plus		1 Plus		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Negative Skin Tests	548	78	53	7.6	51	7.3	50	7.1	702	100
Positive Skin Tests	99	75	15	11.4	4	3.0	14	10.6	132	100
Total	647	76.5	68	9.5	55	5.1	64	8.9	834	100

Because of the rush of work, cultures were not checked against skin tests in time to give prophylactic antitoxin to the group of 132 persons with positive skin tests and positive cultures, as was indicated earlier, should have been done. Had this been carried out, the 54 cases developing in this group could have been prevented.

We hear considerable about the normal throat harboring hemolytic streptococci. To check the results at Berea against a control group, the students and faculty at Eastern State Normal School at Richmond, Kentucky, were cultured. A few sporadic cases of scarlet fever had been reported from the city of Richmond but none from among the college students. These students have essentially the same background and age distribution as those of Berea College. Of a total of 786 cultures, but 47, or 6 per cent were positive. Furthermore, practically all of the positive cultures were read as either 1 or 2 plus, and upon inquiring into the past history of these individuals it was found that in a majority of instances they gave a history of either chronic throat or sinus infection. All but 12 of the positive cultures were in students with negative skin tests.

In making cultures for hemolytic streptococci, the question will naturally arise as to whether the hemolytic streptococci found are scarlet fever streptococci or some other strain. Such a differentiation can be accomplished by testing the organisms in question for specific toxin production. Fortunately a test for specificity is not necessary in a majority of instances. However, under certain circumstances it may be of great importance, as for example:

(1) In cases of puerperal sepsis due to hemolytic streptococci, since it is known that this condition may be of scarlet fever origin.

(2) In cases where a differential diagnosis between scarlet fever and septic sore throat is difficult, because of a confusing clinical picture.

(3) In cases of persistent carriers.

(4) Under conditions similar to those that necessitate tests for virulence of diphtheria bacilli.

Aside from its scientific importance, the taking of nose and throat cultures is of great practical value in providing a rational basis for isolation. Ordinarily all infected individuals and carriers would be quarantined, and isolated from susceptible persons, but in view of the circumstances at Berea College this was not feasible, since the facilities for isolation were limited. Furthermore, with all of the carriers, together with the cases out of school, continuance of classes would not have been justified. It was finally decided to keep all cases of scarlet fever isolated in the

hospital or dormitories provided for that purpose and to quarantine all carriers to the college campus, release from such isolation or quarantine being based on obtaining one negative nose and throat culture. Cultures were taken once a week, it being considered not worth while to take them oftener than this. In some instances the cultures from carriers became negative in one week, a majority clearing in three weeks. In practically all carriers failing to clear in four or five weeks, pathology was found, either in the nose, throat or sinuses. Among the hospitalized cases of scarlet fever, very few cultures became negative in less than four weeks, while some remained positive for five or six weeks. These findings justify the 28 day quarantine for cases of scarlet fever.

Nothing in the way of treatment has been found efficacious in curing the carrier condition. Fresh air and sunshine seem to be most helpful.

After the fifth immunizing dose of toxin had been given to the susceptible group, the quarantine was raised.

SKIN TESTS (DICK TEST).

Skin tests were done on every person connected with Berea College. The many errors that ordinarily attend these tests in the hand of unskilled persons, were repeatedly pointed out by Dr. Dick. She further pointed out that until the need of accuracy in testing and reading the test is understood and a standard technique followed, the value of any series of tests will be questionable.

The toxin used for the Dick test is very carefully balanced as to H-ion concentration by the manufacturers. A slight variation in this will cause precipitation and render the solution inert. Only those preparations licensed by the Scarlet Fever Committee can be depended upon. All alkalies, acids and alcohol must be avoided in the sterilization of syringes and needles and there must be no free alcohol on the skin at the time of the test. Syringes and needles should be boiled if possible in distilled water. A fresh needle should be used on every patient to avoid possible transmission of infection. The forearms from wrist to elbow should be scrubbed with soap and water, dried, washed with alcohol and allowed to dry. To prevent delay in drying, ether may be used after the alcohol.

The importance of special syringes and needles for this test is emphasized by Doctor Dick. An ordinary hypodermic syringe will not permit sufficient accuracy in measuring the dosage and upon applying pressure sufficient to make an intradermal injection in most people, there will be leakage around the shank.

A lee, Schick test syringe with slender barrel and blue plunger and plainly marked in

0.1cc graduations, and a 26 gauge, 5-8 inch, soft metal shank needle, were used at Berea and are considered best for this work. The soft shank needles can be forced tightly enough onto tip of syringe to prevent all leakage. Each time the needle is changed, care should be taken to expel all water by ejecting 0.1cc of toxin. This is an important step and failure to do this explains many errors in testing.

The test is made by injecting intradermally exactly 0.1cc of skin test solution on the flexor surface of the forearm at the junction of the upper and middle thirds. If the skin test toxin is properly prepared, it contains so little foreign protein that pseudo-reactions are practically eliminated and a control test is not necessary or advisable.

At times ecchymosis or bruising of the tissue results, interfering with reading, so that the test was run on both forearms of every person. Great care is necessary to make the injection intradermal. If the injection is deeper than intradermal no reading can be made. If the needle goes too deep it must be withdrawn and re-inserted at another site and not continued up again between the skin layers. If this is done some leakage will occur into the subcutaneous tissues. The best method is to hold the syringe at right angles to the forearm with needle tangent to the skin, holding skin taut with the other hand. Inserting needle in this way one is less apt to go too deep. A bleb or wheal results. On thin skinned individuals this stands up in clear relief. When the skin is thin the wheal does not stand out so clearly, is smaller and more quickly disappears. Therefore, the size of the bleb cannot be used as a measure of the amount of toxin to inject for the test.

The reactions should be read in a bright light, 22 to 24 hours after the test is made. The faintest reddening, 1cm or over in any diameter, constitutes a positive reaction and indicates some degree of susceptibility to scarlet fever. The extent and intensity of the reaction is in direct relation to the degree of susceptibility. Records of the reactions were made showing their measurement in millimeters in two diameters, the intensity of color, and the presence or absence of swelling. A common error in interpreting this reaction is to call a slightly positive test, negative.

Reactions may vary from a faint pink blush to an intense bright red. Sometimes a rash type is seen, consisting of red points on a white background. There may be some swelling associated with the more positive reactions. This is a superficial inflammatory edema of the skin rather than a subcutaneous induration which is characteristic of the Schick test. A positive test can be made to appear negative by drawing the skin taut or

by constriction above site of test. Therefore, tight sleeves must be loosened before the reading is made, and the skin of the forearm should be relaxed by pushing up a little on the skin at the wrist. Slight rubbing of the area often brings out the color better and makes the test easier to read.

Table VI shows the results of skin tests in relation to the different college groups.

TABLE VI.
Results of Skin Tests

Groups	Age Limits	Pos. Tests		Neg. Tests		Total	
		No.	Pct.	No.	Pct.	No.	Pct.
Students	16-30	280	16.5	1418	83.5	1698	100
Faculty	25-60	57	27.1	153	72.9	210	100
Faculty Wives	21-55	15	29.4	36	70.6	51	100
Faculty Children	2-5	34	91.9	3	8.1	37	100
Training School	6-14	84	60.3	53	39.7	137	100
Emergency Workers	30-50	10	10.5	86	89.5	96	100
Nurses	18-30	0	0	13	100	13	100
Outsiders	10-50	22	33.3	44	66.7	66	100
Total		502	21.7	1806	78.3	2308	100

Immunity to scarlet fever will vary according to age and previous exposures to the disease. This is shown very clearly in this table. The highest percentage of susceptibles was among the faculty children of pre-school age, nearly 92 per cent having positive tests. The training school children, ranging in ages from 6-14 years, came next, with a little over 60 per cent positive. Under ordinary circumstances the student group, with ages ranging from 16-30, would be expected to come third. The low percentage obtained in this group can well be accounted for, when it is recalled, as pointed out earlier, that the 350 hospital cases, which are included here, all came from the student group and at the time of testing were skin negative, immunity having been conferred by the disease. Were these 350 added to the 280 with positive skin tests it would bring the percentage of susceptibles in this group up to 37 per cent. Furthermore, it will be recalled that a history of many mild, unrecognized cases of scarlet fever was obtained from among the student group. Also the percentage of positive cultures was higher among students with negative skin tests than any other group, which may account for some additional immunity among them.

The rather high percentage of susceptibles among faculty wives and outsiders was not surprising but a higher percentage of immunity among the faculty was expected.

The low percentage of susceptibility among emergency workers was comparable with age, living conditions and previous background.

One hundred per cent immunity among nurses was not looked for but was not surprising since all gave a history of repeated exposures.

The results of skin testing at Eastern State Normal School, showed that of 786 tested, 208 or 25.8 per cent were positive, as compared with 18 per cent at Berea among the same age grouping.

The Dicks,¹⁶ report that in a series of 30,000 skin tests including all ages, 40 per cent were positive. The percentage of susceptibles is higher in rural than in urban populations. In crowded city schools or institutions there is a higher percentage of immunity than in less crowded districts.

The percentages of susceptibility to scarlet fever for various age groups, as indicated by results of the Dick test in a number of series, closely resemble those noted with the Schick test.

The age distribution of scarlet fever immunity is explained on the basis that the natural immunity transmitted from the mother is gradually lost during the first two years of life, and that thereafter an increasing number of individuals become immune, through manufacturing their own antitoxin, the acquisition of this immunity resulting from infection with the specific antigen which gives rise to a frank or an unrecognized case of the disease.

The acquisition of this immunity largely accounts for the age distribution of the disease, however, a word of explanation seems necessary in this connection. While all statistics show that a majority of both cases and deaths of scarlet fever occur in children under 10 years of age, yet when we consider morbidity and mortality from this disease in relation to susceptibility, we find that the percentage of cases and deaths of those susceptible is considerably higher among adults than children. In view of this, the importance of actively immunizing susceptible adults, as well as children, can readily be appreciated.

Subsequent to skin testing, 63 cases of scarlet fever developed, none of which were in individuals with negative skin tests. This, together with the fact that all persons who were convalescing from scarlet fever had negative skin tests, demonstrates very clearly the efficacy and value of the Dick test in determining susceptibility to scarlet fever.

Practically all individuals who gave a definite history of having had scarlet fever at some previous time, had negative skin tests. The few who reacted positively had very mild reactions, indicating considerable immunity. Perhaps these few belonged to that group who for some unknown reason have a poor immunity mechanism, by virtue of which they may suffer a second or even a third attack, as has been so often observed in a very small percentage of persons in connection with practically all of the communicable diseases.

Two children were encountered who had

been immunized, one, two years, and the other, three years previously, with the three dose series of scarlet fever toxin. Both were now immune as indicated by a negative skin test.

ACTIVE IMMUNIZATION OF SUSCEPTIBLE PERSONS

Immediately upon reading the skin tests, active immunization was started on all susceptibles.

The toxin used in this series was Squibbs No. 10461. It was given in graduated doses as follows:

A first dose of 500 skin test doses of toxin,

A second dose of 2,000 skin test doses,

A third dose of 8,000 skin test doses,

A fourth dose of 25,000 skin test doses,

A fifth dose of 80,000 skin test doses. This is the dosage recommended by the Scarlet Fever Committee. It is graduated so as to give no harmful reaction, yet confer adequate immunity. When the toxin is properly prepared it contains a minimum of foreign proteins and no horse or other animal serum.

The first few doses were given at five day intervals since it was desired to confer immunity as rapidly as possible in face of the epidemic. After the third dose no new cases developed so the interval was increased to 7 days which is considered optimal. The toxin is given subcutaneously. Accuracy in measuring the dosage and care in administration, so as to prevent leakage, are essential to success. The full dosage should be given each time. The tendency, which sometimes arises out of sympathy or other circumstances, to decrease the dosage in those individuals who are experiencing severe reactions, is strongly urged against by Doctor Dick.

Of the 502 persons with positive skin tests, 477 were given the complete series of 5 doses. In three members of the faculty and two students immunization was deferred because of illness. Thirteen students failed to complete immunization because they left school. In seven infants immunization was deferred until they were older.

Of the 63 cases of scarlet fever which developed subsequent to skin testing, 59 developed before the second dose of toxin had been given, and the remaining four before the third dose was administered. All of these cases were extremely mild but one which contracted a middle ear infection as a complication. These results corroborate the statement of Doctor Dick that some immunity develops even after the first dose, progressively increasing with each succeeding dose. After the third dose in our series the epidemic completely subsided.

The question is always asked as to the duration of immunity following active immunization with scarlet fever toxin. Doctor Dick

makes the following statement in this connection:

"While it is not possible at present to give statistics on the duration of the active immunity resulting from administration of these graduated doses of toxin, experience to date indicates that the immunity obtained is comparable in duration to that obtained with immunization against diphtheria, with proper use of diphtheria toxin-antitoxin mixtures. It is considerably more satisfactory than immunity obtained with some commercial preparations of diphtheria toxin-antitoxin now on the market."

REACTIONS AFTER IMMUNIZING TOXIN

Many questions are asked regarding reactions following the injection of immunizing toxin. In an attempt to study these reactions, each individual, upon completion of the immunization, was interviewed in connection with the signs and symptoms following each injection. Although this was not wholly reliable, since some with rather severe reactions minimized them after it was all over, while others with little or no reaction exaggerated their symptoms because of a psychic element, yet it gave a fairly good general conception of what took place. A great many reactions following the various doses were observed by members of the college medical staff but nothing at all alarming was seen, although in a few instances parents had reported cases which had alarmed them.

Each person was asked as to the local reaction following each injection and whether or not they had experienced any nausea, vomiting, diarrhea, headache, joint symptoms, sore throat or rash. The results were charted. No necrosis, sloughs or secondary infections occurred. Of the 460 reporting, practically all complained of some local reaction at the site of the injection, but a little over 70 per cent had no other disturbances. The local reactions consisted of more or less swelling and reddening, which appeared within a few hours and began to subside in from 30 to 48 hours. A little desquamation over the area of skin involved occurred in a few instances. The intensity of the local reaction was directly related to the degree of susceptibility of the individual as indicated by the size and intensity of the skin test. About 20% had more or less headache with some malaise following most of the injections, but no other complaints. Seventy-six had emesis following one or more doses of the toxin. This usually occurred two or three hours after the inoculation, and was more severe where food was taken or following exertion. About 20 had nausea without vomiting. In all cases the nausea and vomiting were of short duration, the normal appetite soon returning. In 26 persons, diarrhea was associated with vomiting. This was of

short duration but rather severe in a few instances. The appearance of a light, transient scarlatinaform rash was noticed in 36 individuals and 5 developed an urticarial rash. Joint stiffness, with more or less soreness in a number of instances but no swelling or inflammation, was complained of by 112. In a majority of these, this occurred only after some one or two of the injections.

The more severe reactions occurred only in persons who were very susceptible to scarlet fever as shown by large, bright skin tests. In some of these persons the skin test reaction was as large as 55x40 mm.

In most instances the general reactions followed either the first, second or third doses. This is explained as being due to the fact that by the time the fourth dose is reached, sufficient immunity has been acquired to prevent reactions. No school time was lost by students because of the reaction. After the immunization, several people remarked that there was a feeling of well being not present before.

URINALYSIS

The question is often asked—Does immunization with scarlet fever toxin ever cause nephritis? In the experience of Dick and Dick, no harmful effects on the kidneys have ever resulted from such immunization. Upon doing a urinalysis in 320, of the 502 actively immunized at Berea, only one nephritic urine was found. This was in a student who was under treatment for nephritis before immunization was started. One student who had marked nephritis before immunization, showed no evidence of abnormal findings on repeated urinalysis following immunization.

RETESTS

It is emphasized by Doctor Dick that unless immunity is carried to the point of an entirely negative skin test, complete protection from scarlet fever cannot be expected, though the severity of any subsequent attack would be modified by the partial immunity.

Two weeks after the last dose of immunizing toxin, retests were made. One skin test dose or 0.1cc of skin test toxin was injected as before in one forearm, and two skin test doses or 0.2cc in the other. A negative reaction to one skin test dose is the criterion of immunity to scarlet fever but we were looking for a greater degree of protection than this.

The results of the retest are shown in Table VII.

TABLE VII.

Results of Retest after Active Immunization

	1 Skin Test Dose		2 Skin Test Doses	
	No.	Percent	No.	Pct.
Negative	467	97.1	423	88
Positive	14	2.9	58	12
Total	481		481	

Of the 481 persons retested, 467 or 97.1 per cent were negative to one skin test dose while 423 or 88 per cent were negative to two skin test doses. Six failed to report for retest.

Upon comparing the positive reactions following the retest with the initial reactions in these cases it was found:

(1) That essentially as many persons with small initial reactions were positive upon retesting as those with large areas of reaction.

(2) That while the retest readings were smaller in most instances than the initial reactions, yet the reduction in size was much more marked in persons with the larger ones.

(3) In practically every instance there was a reduction in the intensity of color, from bright and moderately bright to faint or very faint, following immunization.

(4) That while about 40 per cent of the initial reactions were swollen, there was no swelling in any of the reactions following the retest.

The failure of a certain percentage of susceptible persons to become completely immunized after the five dose series of toxin is, perhaps, to be explained on the same basis as the failure of the disease itself to confer complete protection in a small percentage of individuals, who may go on and have second and even third attacks of the disease, namely, a deficient immunity mechanism.

Of the 63 cases of scarlet fever developing subsequent to skin testing, all of whom had had either one or two doses of toxin, 53 completed the immunization. The remaining ten received no further dosage. At the time of the retest these ten were found to be immunized to two skin test doses. It was felt that the mild form of the disease might not confer complete immunity but apparently it did and the artificial means were unnecessary.

A sixth dose of 90,000 skin test doses was given to all who were positive to two skin test doses. This group was not retested as the sixth dose was given just before the end of the school year.

CLINICAL STUDY OF CASES

It is now clear that like diphtheria, scarlet fever is a local infection of the mucous membrane of the upper respiratory tract. The constitutional reaction is the result of the absorption and circulation of a toxin elaborated by the scarlet fever streptococci. The characteristic rash is the result of the action of the toxin on the walls of the skin capillaries.

When scarlet fever streptococci lodge in the upper respiratory tract of a human being, it is conceivable that if he be susceptible:

(1) They may grow, elaborate toxin, and produce the typical clinical picture with eruption.

(2) The eruption may be scarcely per-

ceptible, lasting only a few hours, and escape notice by physician, nurse or patient.

(3) There may be no eruption.

It is evident that the cases belonging to (2) and (3) will escape recognition unless they occur, as is most frequently the case, in association with a frank, recognized case of the disease. Just what percentage of the total number of infections, the missed cases constitute is not definitely known. Reports from a number of investigators including the Dicks, Newsholm,¹⁷ Thornton,¹⁸ and Diel and Shepard,¹⁹ indicate that a large majority of infections with the scarlet fever streptococci are unrecognized because of the absence of a recognizable rash, passing as simple sore throat, tonsillitis, etc. This undoubtedly accounts for the immunity in those persons who give no history of scarlet fever but have negative skin tests.

Four hundred and fourteen cases were hospitalized at Berea. The average age of this group was 19 years. Because of the rush of work and lack of personnel, hospital records were not kept up as well as usual, however, a few of the clinical manifestations were deemed worthy of consideration.

Of the 414 cases, 139 were so mild that they were sick, clinically, for only a day or two with a temperature under 100. In 275, the temperature ranged from 100-104 from 2-15 days. A rash was recognized on 83 or a little over 20 per cent. Five others desquamated, showing rash had been present but not recognized. Fifty-six cases were reported by the laboratory as having albumen during their hospital stay, but further examination of the urine was not made at the time. A later check showed several cases of nephritis among this group. Only 24 cases had frank emesis although a large percentage complained of nausea.

The complications developing in this series were as follows:

Severe cervical adenitis.....	30
Middle ear complications.....	10
Mastoiditis requiring surgery.....	2
Peritonsillar abscess.....	10
Arthritis	8
Abdominal complications, 3 requiring appendectomy	7

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Because of the mild type of epidemic and expense to students, only four of the more severe cases, with complications, received specific treatment. Two were given scarlet fever antitoxin and two convalescent serum. In all four instances rapid recovery followed.

OTHER SCARLET FEVER STUDIES TO BE REPORTED LATER

On May 7, the State Board of Health was notified of an outbreak of puerperal sepsis

in one of the hospitals in Lexington, Kentucky. A thorough investigation of this situation disclosed the prevalence of scarlet fever at this institution and all evidence obtained definitely indicated that the cases of puerperal sepsis were of scarlet fever origin.

In view of these findings a control program similar to that at Berea, was carried out.

On May 23, representatives of the State Board of Health, reported at Clay, Webster County, Kentucky, to assist the local physicians and local board of health in controlling a widespread outbreak of scarlet fever in this community. Again we were most fortunate in obtaining the services of Doctor Gladys H. Dick, and again, essentially the same program which was carried out at Berea was instituted here. However, an additional interest presented itself in this study in that an immunization program, using a preparation known as "ricinoleated antigen" and put out by Ely Lilly and Sons, had previously been carried out by the local physicians, and yet many of those so immunized continued to develop scarlet fever.

Since these studies will be reported in detail later on, all that is desired at this time is to point out:

(1) The results obtained corroborated those at Berea.

(2) The ricinoleated antigen not only failed to immunize, even temporarily, but in addition, its use was followed by severe reactions and gave the people a false sense of security.

COMMENT

The scientific developments in connection with scarlet fever during the last six years have resulted in a new conception of this disease and its control.

With the production of experimental scarlet fever in human beings it was possible to demonstrate that a specific hemolytic streptococcus was the cause of this disease. With this knowledge the demonstration of a true soluble toxin, elaborated by these organisms and specific for scarlet fever, followed. In turn it became clear that scarlet fever is a local infection of the mucus membrane of the nasopharynx, the invading streptococci elaborating a toxin, the absorption and circulation of which gives rise to the rash and other constitutional symptoms.

The discovery of the specific toxin for scarlet fever enabled the development of:

(1) A skin test to determine whether an individual is susceptible or immune to scarlet fever.

(2) A method of actively immunizing susceptible individuals against scarlet fever so that they do not contract the disease on exposure.

(3) An antitoxin specific for scarlet fever.

(4) A method of differentiating scarlet fever streptococci from other hemolytic streptococci.

The discovery of a specific hemolytic streptococcus as the cause of scarlet fever, with its localization in the nasopharynx, enabled the development of a method of detecting infected individuals and carriers by means of nose and throat cultures on blood agar plates.

The demonstration of a local blanching of the scarlatinal rash about the site of an intradermal injection of either convalescent serum or scarlet fever antitoxin has provided an important confirmatory test in differential diagnosis of this disease.

Application of the above knowledge constitutes a scientific means of effectively controlling scarlet fever. However, it is to be strongly emphasized that the success and uniformity of results, attendant upon applying such knowledge, are, to a large degree, dependent on the care and accuracy with which each step is carried out. Prominent among the factors which have caused discrepancies and questionable results are the following:

(1) Lack of care and accuracy in the preparation, standardization and preservation of toxin and antitoxin.

(2) Lack of care and accuracy and failure to follow a standard technique, both in performing and reading the Dick test.

(3) The use of improper syringes and needles for the injection of skin test toxin.

(4) Inadequate dosage of immunizing toxin.

(5) Carelessness and inaccuracy in administering immunizing toxin.

(6) Failure to retest after the 5 dose series of toxin with the subsequent omission of the 6th dose to those still susceptible.

(7) Lack of proper technique in preparing blood agar plates.

(8) Inaccuracy in taking and reading cultures.

The taking of nose and throat cultures on blood agar plates, together with the blanching test and the epidemiological findings, gave clear evidence that the epidemic at Berea College was scarlet fever.

The taking of cultures on everyone connected with the college, resulted, first, in finding a large number of carriers and second, in demonstrating that scarlet fever occurs in a majority of instances without a recognizable rash, cases which, if cultures were not taken, would frequently be missed even in the presence of an epidemic and invariably be missed where they occurred sporadically. Of the 414 hospitalized cases of scarlet fever at Berea, but 83 or a little over 20 per cent had a recognizable rash. Desquamation occurred in 5 others, showing that rash had been present but not recognized. With the discovery of all

cases and carriers by means of cultures, together with subsequent weekly culturing until negative results were obtained, an effective system of quarantine and isolation, with release from same, was made possible.

Experience in this epidemic showed the Dick test to be a definite and reliable clinical test to determine immunity and susceptibility to scarlet fever. While 63 cases of scarlet fever developed in persons with positive skin tests before immunization was completed, no cases occurred in persons with negative tests. Furthermore, all individuals who were convalescing from scarlet fever had negative skin tests.

Of the 2308 persons tested, 502 or 21.7 per cent were positive. This represents a rather high percentage of susceptibility in view of the presence of 350 known cases of scarlet fever at the time of testing, all of which had negative skin tests by virtue of having had the disease, together with a history of a large number of mild unrecognized cases during the previous two months.

The finding of positive cultures in persons with positive skin tests indicated potential infection, and justified prophylactic antitoxin, but because of the rush of work this was not given. Of 132 such persons, 53 developed extremely mild cases of scarlet fever while one had a rather severe case with ear complications.

The mild sore throats in this epidemic conferred immunity as well as the typical cases of scarlet fever with rash, as shown by skin tests.

Active immunization of all susceptibles brought this epidemic under complete control within 7 days or the time necessary for giving two doses of toxin. Among the 502 susceptible persons, only 63 developed scarlet fever subsequent to skin testing and culturing. Of these, 59 developed before the second dose of toxin had been given, and the remaining 4 before the administration of the third dose. Of the 63, fifty-four had positive cultures at the time of skin testing.

The administration of prophylactic antitoxin would have brought more striking results, but such protection is only temporary, disappearing in a week or ten days, after which the epidemic would, in all probability, have lighted up again and continued to the end of the school year. Also this would have sensitized the susceptible group to horse serum. The use of antitoxin for temporary control, followed by active immunization for more lasting protection was not deemed advisable because of the added expense, sensitization to serum, and the difficulty of getting those concerned to return for active immunization, after having been passively immunized, and thus losing the opportunity of con-

ferring a more lasting protection.

The administration of the 5 dose series of scarlet fever toxin conferred complete immunity in 97.1 per cent of the susceptible persons as indicated by a negative skin reaction to one skin test dose, with 88 per cent negative to two skin test doses. The failure of a certain small percentage to become completely immunized after the 5 dose series of toxin is explained on the same basis as the failure of the disease itself to confer complete immunity in a small percentage of individuals, namely, a deficient immunity mechanism. Two cases immunized with the three dose series of toxin, one, two and the other three years previously, still showed complete immunity.

While practically all of the persons immunized had more or less local reaction following each injection of toxin, a majority had no other disturbances. The most severe general reactions consisted of general malaise, nausea and vomiting of short duration and various degrees of joint stiffness, all recovering with no noticeable ill after effects.

CONCLUSIONS

The results reported show that an epidemic of scarlet fever can be adequately controlled by application of the following means:

(1) Nose and throat cultures on blood agar plates to detect infected individuals and carriers, with isolation and quarantine, and release from same, based on the results of such cultures.

(2) Skin tests to detect susceptible individuals.

(3) Active immunization of all susceptibles with the 5 graduated doses of scarlet fever toxin recommended by the Scarlet Fever Committee.

(4) Retests two weeks after the fifth immunizing dose, with the administration of a sixth dose to those who still react positive to the skin test.

In the light of these findings it is unnecessary today for an individual to have scarlet fever.

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LABORATORY WORK IN SCARLET FEVER EPIDEMICS AT BERE A 1929

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The purpose of this article is to give a general outline of the laboratory methods employed in the scarlet fever epidemic at Berea, Kentucky, also the method now in use at the State Board of Health Laboratory for the detection of hemolytic streptococcus.

Obtaining Specimen—The throat and nose of each suspected carrier was swabbed with sterile cotton swabs, using one for the throat and another for both nares. These were immediately streaked on blood agar plates which had been divided in half by means of a line made with a wax pencil across the bottom, one half being marked "N" and the other "T." The name or the patient's number is then placed on the top of the plate which is incubated at 37.5 degrees centigrade for 24 hours. If the medium is properly made and the ph is correctly adjusted, a reading may be made if necessary in 15 to 18 hours.

Preparation of Medium—The medium, giving the best results, was made according to the following formula:

Agar,	1½ per cent
Salt	5 per cent
Beef extract	3 per cent
Peptone	1 per cent
Defibrinated or citrated blood (sheep or human)	3 per cent

The agar should be made and carefully adjusted to a hydrogen ion concentration of 7.2 and sterilized in an autoclave for 30 minutes at a pressure of 15 pounds. It should then be cooled to a point where it is comfortable to place the container against the forearm and the blood added and thoroughly mixed by rotating the flask or bottle containing the medium. It should then have a bright red color and is immediately distributed in 10cc amounts in Petri's dishes, where it is allowed to cool before being moved.

Care should be taken not to add the blood to the agar while it is yet too hot. This produces a brown discoloration of the medium upon which it is practically impossible to accurately identify streptococcus colonies or to differentiate between hemolytic and green producing streptococci. Caution should also be taken not to wait until the agar has cooled too far as this causes tiny specks of agar, with which the blood has not mixed, to be distributed over the plate. These specks resemble the hemolyzed areas surrounding hemolytic streptococcus colonies making a plate very difficult to read.

It is never advisable to use agar stock containing glucose or dextrose as this seems to be inhibitory to the growth of hemolytic streptococcus and best results cannot be obtained.

Of most importance in the preparation of the medium is the addition of the blood. Human or sheep blood is always preferable because because of one's ability to obtain it in a sterile condition in practically all instances. However, it is not practicable to obtain either in large amounts except where the work is being done in a laboratory where animals are being kept for bleeding purposes or in some institution where large numbers of students are available for giving blood. At Berea, Kentucky, where the laboratory work was carried on with marked results and success, nothing but human blood was used. Later at Richmond in the early stages of the work an effort was made to substitute beef blood. The difficulty with which this was obtained in a sterile condition resulted in a large number of contaminated plates which of necessity required that the specimens be taken again.

READING PLATES

The accurate reading of the plates must be attended with some experience by the reader.

The method employed is one which is used and recommended by Doctor Gladys Dick of Chicago, under whose direction the entire work was carried out.

The plates are read before a window and graded 1 plus, 2 plus, 3 plus, and 4 plus according to the number of colonies or amount of hemolyzed area along the lines of inoculation. A 1 plus plate only has a few scattered colonies along the line of inoculation or possibly may have colonies upon one line or at the beginning of the first streak made across the plate. If the worker has turned the swab in the fingers with a rotary motion as the process of streaking was carried out, the colonies will be on any of the lines of inoculation. However, a 1 plus plate is one which has from 5 to 20 well defined hemolytic streptococci colonies. From this the grading ranges up to 4 plus where there are many colonies along every line of inoculation or the entire area is hemolyzed.

Sometimes difficulty is experienced in differentiating between green producing streptococcus and hemolytic streptococcus and careful observance should always be made for the faint greenish discoloration produced in the hemolyzed area by the streptococcus viridens.

One should not confuse hemolytic staphylococcus with hemolytic streptococcus. The hemolyzed area of the staphylococcus colony is larger and the colony itself is larger and more opaque than the streptococcus colony.

The bulk of the laboratory work in the epidemic at Berea, was carried on in improvised laboratories established at the site of the outbreak. Many difficulties were met with and surmounted which will prove of incalculable value to future workers in epidemics of this character in Kentucky.

After the representatives of the State Board of Health left it was necessary for the local health office or those in charge to make many recultures on convalescents and known carriers and it was not found expedient to keep blood agar plates on hand or to send them through the mails, so a method had to be devised for getting these specimens to the main laboratory, where they could be properly plated and read. After some experimentation and checking on results, it was found that a specimen taken and immediately inoculated upon coagulated blood serum (Loeffler's medium) slanted in tubes and mailed into the main laboratory where it was replanted on blood agar plates, would show positive in 90 per cent of instances if it had shown positive on direct plating on blood agar. In warm weather it has not been found necessary to incubate the specimen on the coagulated serum after it has reached the laboratory. Sterile, separately wrapped swabs and tubes of blood serum are now prepared and distributed from the main laboratory. This offers a practical method for obtaining cultures for hemolytic streptococci by physicians and health officers without laboratory facilities.

The amount and quality of work together with the results obtained has proven that it is not necessary to always be in a laboratory equipped to the fullest with a lot of highly specialized apparatus and ideal surroundings.

The fact that this work was carried out with the greatest of success and accuracy in laboratories which had practically no equipment at all, which is contrary to the general belief that has heretofore prevailed that this type of work, which has always been considered very difficult under the best conditions, could not be carried out without the use of a highly equipped laboratory, has served to remove the veil of mystery which has generally shrouded the isolation and identification of hemolytic streptococcus in the minds of most doctors not

specializing in laboratory work, and has brought within the reach of all, the knowledge of and ability to do this highly important type of work.

At Berea there were no autoclaves or sterilizing ovens suitable for use. Plates were sterilized in a baking oven with an electric sad iron as a heating unit. A small autoclave was brought into use which was run many times a day to do the work required.

Possibly the largest piece of work of this character ever done was carried out at Berea. Nearly 1,000 blood plates a day were needed to keep up with the program of skin testing set up by Doctor Dick, both skin testing and taking of throat and nose cultures being done simultaneously.

Yet with this enormous amount of work done under strained working conditions, results proved that accuracy was being attained.

All work was done by students of the School of Laboratory Technique directed by staff members of the State Board of Health Laboratory, who were complimented very highly by Doctor Dick upon their ability to accomplish what they did.

THE HEART IN THE ACUTE COMMUNICABLE DISEASES*

By MORRIS M. WEISS, M. D., Louisville.

The multiplicity of lesions of the cardiovascular system which occur in the communicable diseases are of common note. The mode of death in such diseases is frequently a vascular or cardiac one. Because of these factors a study of the heart and vessels in the more common of these conditions merits careful thought. Especially important is a study of the permanent effect of the infectious agents on the heart and their relation to chronic heart disease. This essay will not include consideration of rheumatic fever or syphilis.

Heart disease is the prime cause of present-time death. It is responsible for 10 to 15 per cent of the deaths from all causes. It far surpasses that of cancer and is approached only by pneumonia. As long ago as 1925 heart disease killed 185.5 persons of each 100,000 of the United States population. More people are dying of heart disease now than did a generation ago. Part of this is due of course to the growth of this Nation's numbers; part to the prevention and control of less elusive maladies; part to the longevity that doctors have gained for their neighbors; part to more accurate diagnosis. But whatever the cause may be, factual it is, that the morbidity of heart disease in the United States has been increasing. To prevent this

*Read before the Jefferson County Medical Society.

"rising tide of heart disease" we must have careful cardiac surveys based on an etiological classification. A study then of the relation of the communicable diseases to chronic heart disease is important from the preventative point of view.

During the course of the communicable diseases any or all of the cardiac structures may be involved. This gives rise to multiform signs and symptoms depending on whether the endocardium, myocardium, pericardium, or the special conductile tissue is involved. The endocardium is rarely if ever involved and healing always takes place without permanent valvular insufficiency. Pericarditis is a more frequent accompaniment but resultant visceroparietal adhesions when they occur are never sufficiently severe so as to embarrass the heart's action. Alterations in the myocardium constitute the most frequent and the most important change. In addition there is always present the generalized circulatory disturbances of the toxemia *per se*.

Aside from the sex and age incidence of the disease itself these factors play no role in the cardiac manifestations.

Although cardio-vascular disturbances have long been associated with the communicable diseases it has only been in recent years, especially with the development of the electrocardiograph and more exact methods of diagnosis, that the early nature of these disturbances have been appreciated. With refined instruments of precision we can detect cardiac involvement even when clinical signs with reference to the heart are absent or ambiguous.

The signs of cardio-vascular involvement in the communicable diseases may be multiple or few. It is very important to separate those signifying actual cardiac involvement from those produced by toxemia. Frequently this is difficult. Disturbances in rate or rhythm such as auricular fibrillation; auricular flutter or heart block; very feeble heart sounds; cardiac dilatation; hepatic engorgement; evidence of pericarditis, dry or serous, and diastolic murmurs are organic signs and indicate an endocarditis, pericarditis, or myocarditis. However, tachycardia or bradycardia, systolic murmurs, changes in the quality of the pulse, premature contractions, slight changes in the first heart sound, varying degrees of pallor or cyanosis, cold extremities—may be and frequently are only an expression of toxemia.

Very evident signs of myocardial involvement are easily detected, but they are often minimal. Severe and widespread lesions of the myocardium may be present without producing any striking clinical signs. It is here that graphic registration of the conduction

mechanism by means of the electrocardiograph taken at frequent intervals gives valuable clinical aid. This is especially possible with the portable electrocardiograph when the patient is too ill to be moved or the larger stationary type of instrument is not available. The importance and value of instrumental examination of the heart is evident from the lack of correlation between clinical and electrocardiographic signs of myocardial involvement. With only the presence of a rapid rate, serious disturbances in auriculo-ventricular or intra-ventricular conduction or T-wave inversion may be present indicating myocardial changes. Since these conductive disturbances cannot be detected clinically, we must have recourse to the electrocardiograph for their recognition. In addition auricular fibrillation, auricular flutter, paroxysmal tachycardia, and premature beats have been noted. Auricular fibrillation is infrequent. While this may be due to the relatively slight involvement of the auricular muscle in the communicable diseases (1), this is not the sole explanation since with marked involvement of the ventricular muscle, ventricular fibrillation rarely if ever occurs. It is our belief, however, that the frequency of the arrhythmias depends in a great measure on the ease with which the heart rhythm is studied by means of the electrocardiograph. Since myocardial involvement is a frequent accompaniment of the communicable diseases the chances of functional disturbances of rhythm are consequently very great. Repeated electrocardiograms should be of invaluable aid. This belief is based on our studies of auricular fibrillation in children in relation to acute rheumatic fever (2).

It must be remembered that disturbances in conduction cannot be taken as direct evidence of the degree of anatomical change in the myocardium. The physiological phenomena cannot always be correlated with the extent of the pathological findings. As in paroxysmal fibrillation in exophthalmic goitre, we can only explain some transient types of electrocardiographic disturbances by physiochemical changes in the heart muscle cell. On the other hand there may frequently be focal areas of myocarditis of varying extent which do not involve the conduction system and hence cannot be detected by the electrocardiograph. This however, is rare and a normal electrocardiograph can be considered evidence of a normal or minimal involvement of the myocardium.

A slow pulse rate is frequent during the course and convalescence of the acute disease. Here again the electrocardiograph is of invaluable aid in revealing the harmless nature of the bradycardia and differentiating it from complete or partial heart block. It is almost

always sinus in origin, due to depression of the sino-auricular node, the pacemaker of the heart, and the prognosis is good.

Of all the clinical signs, tachycardia is the most difficult to interpret. It may as readily arise from the increased metabolism of fever as from injury to the heart itself. Or it may be but a manifestation of increased reflex irritability of the heart as a result of the infection or exhaustion following the acute illness. A study of the heart rate during sleep offers a valuable aid in differentiating a functional from an organic tachycardia. During sleep the multitude of stimuli that reflexly influence the heart rate over the nervous pathways to the heart are to a large extent eliminated. Hence a functional tachycardia will disappear during sleep but a rapid rate, the result of increased physiological needs of the individual, will remain unchanged. A very common condition occurring during convalescence from the communicable diseases is the syndrome of neuro-circulatory asthenia. These patients may complain of palpitation, shortness of breath, and precordial pain. Whenever they are examined they exhibit rapid heart rates. It is a problem in each case to decide whether the symptoms are due to a true myocarditis or to a functional disturbance. In such instances the study of the heart rate during sleep is of inestimable value. It may be set up as a rule that whenever the tachycardia is functional, that is, whenever it is determined by increased excitability of the heart to emotional and other reflex stimuli, it will disappear during sleep, while the heart rate of a true myocarditis remains unchanged. Such observations of the tachycardias during sleep have been made by Boas and myself by means of the cardiotaehometer (3).

Hypotension is common and is chiefly the result of involvement of the vasomotor system. The pressure gradually returns to normal during convalescence.

The pathological-physiological changes in the circulatory system which occur in the communicable diseases are well illustrated clinically and experimentally in the effects produced by the diphtheria bacillus and its toxin. The characteristic lesion is a toxic parenchymatous hyalin degeneration or necrosis of the myocardium associated frequently with a fatty degenerative infiltration (4). Following this initial injury if the patient lives, there results as early as three to six days later, a reparatory inflammatory process accompanied by muscle regeneration. During the next two to six weeks complete regeneration of the muscle occurs, with or without varying degrees of fibrosis. Endocarditis rarely occurs and if it does, healing always takes place without permanent valvular insufficiency (5). The

myocardial changes may be localised or diffuse and may involve the vagus nerve, the Bundle of His or the Purkinje fibers but the toxin has no special affinity for either the conductive or contractile mechanism of the heart. While the myocardial regeneration is accompanied in some instances by scattered areas of fibrosis, there is no clinical or electrocardiographic evidence that permanent injury to the heart ever results. Should an individual recover from the acute infection, even though severe cardiac involvement occurred, no permanent detectable abnormality of the circulatory mechanism becomes established (6). Permanent cardiac enlargement never occurs. The conduction disturbances are transitory indicating that the myocardial changes return to normal without graphic evidence of any permanent damage to the heart muscle.

Circulatory collapse is the chief cause of death in diphtheria but the exact mechanism is not understood. Neither degeneration of the vagus nerve, so-called "cardiac paralysis," nor a specific affinity of the diphtheria toxin for the conduction system play any role as some would believe. Nor can the myocardial changes always present in fatal cases due to circulatory failure due to diphtheria be still profound functional disturbances (7). Circulatory failure may result from severe and prolonged myocardial degeneration in cases where there has been delayed muscle regeneration but Romberg (8) and others (9) have shown that the heart of an animal dying of circulatory failure due to diphtheria is still capable under certain conditions of maintaining a very satisfactory blood pressure. The chief cause for the circulatory collapse is failure of the peripheral circulation. As a result of toxic damage to the vasomotor centre, the peripheral vasomotor nerves or direct damage to the vessel walls, the blood pressure falls and the circulation fails. There is abundant experimental evidence to support this contention (7). While there is marked diminution in the amount of epinephrin in the adrenal glands this is not characteristic of diphtheria and cannot be considered the cause of the circulatory collapse (7). The problem is still unsolved but clinical and experimental evidence favors failure of the peripheral circulation as the chief cause of death.

Because of the recent influenza epidemic, a detailed consideration of the effect of the influenza virus on the cardio-vascular system may be of interest. Parenchymatous changes occur in the myocardium in influenza as in other acute infections but they are transitory. The post influenza collapse, asthenia, prostration, and hypotension which are of common occurrence for variable weeks are not cardiac in origin (10), but are due to derangement

of the vasomotor mechanisms. Disturbances in suprarenal function have been suspected to explain these signs (11) but there is no convincing pathological or pharmacological evidence to support this contention (12). Neither adrenalin nor the whole gland have any lasting therapeutic value. We have had no experience with the use of ephedrin.

The influenza virus causes no permanent cardiac changes but it wreaks its harm in lighting up latent cardiac lesions. We have frequently seen fresh rheumatic verrucae on the valves of quiescent cases of mitral stenosis who have died from influenza. Many cases of sudden cardiac asystole during convalescence are undoubtedly due to coronary thrombosis. Huchard (13), has pointed out that angina pectoris and coronary sclerosis could be aggravated by an influenza infection. Transient complete heart block can occur in an individual suffering from previous myocardial disease (14). Gwyn (15), reports a case of coronary thrombosis following influenza and believes that since thrombosis occurs in so many different arteries in the course of the various infections, the coronaries must suffer in some proportionate degree and hence coronary thrombosis occurs. Stoerk and Epstein (16) found in young adults who died of epidemic influenza destruction of the internal elastic layer and necrosis of the muscle of the media of the peripheral vessels scattered throughout the body irregularly, but especially noticeable in the coronary arteries. Boyd (17), has found that an extensive suppurative process in a person with arteriosclerosis may cause an acute exacerbation of vascular lesions wherever they are situated and in the case of the coronaries may lead to fatal thrombosis. We can then readily understand the occurrence of coronary thrombosis following influenza. In addition the marked lowered resistance produced by a severe infection may be responsible for an endocarditis caused by a secondary invader.

The dilatation of the right heart frequently found in fatal cases of influenza is due to the heightened tension of the pulmonary circulation produced by the coincident pneumonia.

The prognosis of cardiovascular involvement in the communicable diseases is good after the acute stage of the illness has passed. Marked and rapid clinical improvement despite severe myocardial involvement is always a very striking feature. The communicable diseases have no etiologic importance in chronic heart disease. They may be a predisposing factor to rheumatic fever or coronary occlusion but we cannot agree with Albert (18), that they produce a "maiming" effect on the heart. Nor can these diseases of the young be responsible for the so-called degen-

erative cardio-vascular diseases of the old. Unless more evidence is adduced we cannot say that hypertension, coronary sclerosis, or other general or localized areas of atherosclerosis are the result of a remote diphtheritic or scarlatinal infection.

It is of interest to note an indirect effect of communicable disease control on heart disease. One explanation for the increasing morbidity and mortality rate of heart disease is an increase of life expectancy, due in part to reduction in the mortality rate of the contagious diseases. Since the age curve of cardiac mortality shows a progressive rise after the age 45, and since more people are reaching this age and beyond due to communicable disease control, more people then must die from heart trouble.

Cardio-vascular complications should be treated as they arise. This treatment does not differ from the usual one of organic heart disease. So-called cardiac stimulants such as strychnine and camphor are ineffective and useless. Pituitrin, because it is a vasomotor stimulant, may be of value as has been recently recommended in pneumonia (19). Epinephrin has only a transient action. Digitalis is indicated only in the presence of heart failure. It has no value in preventing this complication and there is no convincing evidence that it can support the heart through a severe emergency. It is especially indicated when auricular fibrillation or flutter are present but because of the rarity of these arrhythmias should not be given in anticipation of them. Digitalis has a questionable effect in slowing a rapid rate even in the absence of fever nor can it elevate blood-pressure. Its administration should be especially guarded in children where the therapeutic dose is unknown. Absolute bed rest is very important. No exercise should be allowed until clinical or electrocardiographic evidence of myocardial involvement have disappeared. Graphic examination during convalescence is especially important since it has been shown that evidence of myocardial changes may be detected several weeks after clinical signs referable to the heart have disappeared (20).

In conclusion let us not forget that while we have concentrated on the heart and vessels in the acute communicable diseases, we must look at our patient as a whole since these conditions are systemic maladies.

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DISCUSSION

Emmett F. Horine: I have certainly enjoyed this very excellent paper which considers the modern knowledge concerning the heart during the course of the communicable diseases. We should remember that if the patient survives the communicable disease, even though myocardial involvement has been present, a complete recovery ensues.

Effort syndrome, as has been mentioned by the essayist, may persist for some time after the acute infection has ceased to exist. In effort syndrome or as Sir Thomas Lewis terms it "neuro-circulatory asthenia" we have a group of symptoms very distressing to the patient. Even on slight exertion marked and distressing cardiac manifestations may be experienced so that in a measure the patient is incapacitated. Unfortunately at times, some physician is seen who does not recognize the functional nature of the condition and instead tells the patient that an organic cardiac defect has resulted from the infection. Thus such a patient, with uncomfortable symptoms, being told that heart disease exists and feeling badly enough to believe anything accepts the verdict and becomes an invalid. Yet we should realize that, by proper management, effort syndrome is curable.

The important thing for us to recognize is that an irritable heart may follow any type of infection and that, primarily following an infection, we must guard the patient against early and undue exertion. If the patient has been properly instructed to take a moderate and gradually increasing amount of exercise sufficient cardiac reserve is secured which will later permit resumption of a normal mode of living.

The essayist has emphasized the importance of the electrocardiograph in determining certain types of myocardial involvement during acute infection. This is very important and not as

fully recognized as it should be. Too often clinicians depend on the presence of murmurs for diagnosis. We have long recognized that systolic murmurs in the average case do not tell us whether or not cardiac disease is present, nor can we rely entirely on diastolic murmurs. We can rely, however, on the evidence presented by electrocardiograms. In myocardial involvement we may have evidence of defective conduction between auricles and ventricles. Further, changes in the ventricular complexes may be indicative of actual heart involvement.

One important point that was mentioned is the fact that with infection, particularly influenza, there is a possibility that an old slumbering cardiac lesion may be relighted. For example, an apparently inactive rheumatic heart lesion, such as a mitral stenosis, may become active as a result of the acute infection. Such cases suggest that we should instruct all patients with a rheumatic type of heart to always go to bed immediately when any acute infection develops—even a common cold. We want the rheumatic individual to realize the possibility of reactivation of the former infection and, therefore, upon the appearance of any type of infection he should attempt to overcome it as quickly as possible.

R. Alexander Bate: I enjoyed the paper very much and agree with almost everything said by the essayist. The fact that infection produces cardiac changes which are no longer considered hopeless, as shown by the essayist, is a matter of the greatest importance. Former ideas concerning the fatality of all cardiac lesions were exaggerated.

In regard to the causes of cardiac changes during infections, I think the essayist has covered the ground rather thoroughly, but it might be well to emphasize a few points. According to the old time clinical observations the second sound of the heart was first to be affected, for instance, as observed in typhoid fever and in other severe types of infection this corresponds to the essayist instrumental findings. Recent observations during infectious diseases have been made showing what changes take place in the thyroid, suprarenals and certain other of the ductless glands. Perhaps we may have a more definite idea of the extreme systemic conditions which may arise under the influence of infections, if we consider diseases of the endocrine system, like tropical sprue, where death is believed the result of suppressed endocrine activity. All patients exhibiting cardiac disturbances during acute infections should be carefully studied in regard to ductless gland function. We know the liver detoxicates fifty per cent of the poison of the blood in passing through, therefore I think it might be mentioned that treatment should not be directed solely to the cardiac lesion. We may reasonably consider prophylactic treatment in these cases. We know that erysipelas, pneumonia and other acute

forms of infection have been treated with endocrine products and excellent results have obtained both from poly-glandular therapy and individual gland products. I have often secured a favorable response from the oral administration of these preparations; pituitrin, as you know, was reported used in 1908.

I believe we will learn much in regard to the role the endocrine glands play in the production of cardiac functional disturbances. It may be found eventually that myocarditis and other cardiac manifestations owe their origin to altered secretion of some ductless gland that ordinarily maintains health and normal function, such as the calcium metabolism controlled by the parathyroids.

Blood electrolytes require the calcium molecule. That the pituitary secretions influence the thyroid and suprarenal secretions which greatly influence cardiac activity there is no shadow of doubt in my mind.

Strophanthus has seemed superior to digitalis in the type of cases the paper considers.

Armand E. Cohen: The paper just presented is a most excellent one. Since it follows the recent epidemic of influenza it is particularly timely.

Dr. Weiss has been quite modest in describing the work done with the cardiometer, since together with Dr. Boas, at the Montifiore Hospital, New York, he has done a great deal of the original work with this instrument.

From the information presented this evening, it would seem that we have a right to assure our patients acquiring heart complications during an illness from a communicable disease, that unless there was cardiac disease existent prior to his present illness, no chronic pathological involvement of that organ is likely to persist.

There are a few questions which this paper has suggested. In former years there was considerable discussion regarding the use of digitalis in the infectious diseases. Many men favored the use of the drug only when acute cardiac symptoms manifested themselves, while others preferred having the heart gradually digitalized from the onset of the disease. Do cardiologists now assume that digitalis is without any particular effect during an acute infection?

Recently I had under observation a patient with massive bronchopneumonia of the influenzal type. The patient from the onset had a persistent tachycardia above one hundred and forty per minute. He was digitalized according to the Eggleston method but the cardiac symptoms became worse, the pulse was not appreciably influenced and the patient died from myocardial failure. Dr. Weiss, in consultation, saw this patient and I believe his findings agree with his statements and illustrate the insufficiency of digitalis in such cases.

Another question I should like to ask is regarding coramine and similar drugs recently intro-

duced and recommended particularly by the various commercial drug houses for myocardial and respiratory failure. Adrenalin, atropine and strophanthine have been the only drugs I have found of any real value in these emergency conditions and I am loath to forsake them unless there is definite clinical and laboratory evidence that any of the new drugs or combinations will better answer the purpose.

Morris M. Weiss, (in closing): Since the adrenal glands are involved in influenza, the whole adrenal gland and adrenalin have been recommended for the circulatory collapse. There is no pharmacological nor clinical evidence that glandular therapy has any value. Rest in bed will be followed by the same results.

The question of myocardial versus vasomotor failure in diphtheria and other communicable diseases has not been entirely settled. While it is true that in every fatal case in diphtheria due to circulatory failure necropsy has demonstrated involvement of the myocardium, it has been shown experimentally that the heart of a diphtheritic animal dying of circulatory failure is still capable of maintaining a satisfactory blood pressure. Experimental evidence seems to favor failure of the vasomotor mechanism as the cause of circulatory death in diphtheria.

The treatment of the circulatory failure in pneumonia by digitalis is still empirical. Scientific information might be obtained if a large number of pneumonia patients were studied under carefully controlled conditions.

Cardiazol and coramine have no value in the circulatory failure of the communicable diseases.

Role of Skin in Treatment of Visceral Pain.—Sicard and Lichtwitz discuss the mechanism involved in the local intradermal or subcutaneous treatment of visceral pain. They reject the theory of the peripheral or the ascendent anesthetic action of cocaine, because not only anesthetic agents but even distilled water may check visceral pain on the condition that the corresponding skin area of the pain projection is well infiltrated. On the other hand, by section of the anterolateral white column of the spinal cord, performed experimentally by the authors, all pain below the site of the section was abolished. Therefore the authors explain the effect of intradermal injections by a local shock of the nerve endings, which is referred to the nerve centers in the lateral part of the spinal cord, through which also are transmitted the painful irritations from the viscera. If the referred shock is strong enough to inhibit the spinal nervous centers, the centripetal propagation of the painful irritation of the viscera is interrupted, does not reach the cerebral cortical centers, is not perceived by them as a sensation of pain into the corresponding skin area (dermatome). Thus the pain is not felt.

GLYCOSURIA*

By L. LYNNE SMITH, M. D., Louisville.

Reducing substances are present at times in the urine, producing problems that may become difficult to clear. The differentiation between glucose and other reducing agents to copper solution is of interest commercially as well as medically.

Life insurance companies are inclined to deal less harshly with the glycosurias of today rather than a period of ten years ago. Now borderline cases are being accepted at higher ratings, and no reasonable doubt must exist from either a commercial or medical viewpoint as to whether we are dealing with a true glycosuria or some reducing substance which has no significance.

Complicated tests must be eliminated as much as possible. Haines' and Fehling's copper solutions should be discarded, especially from the fact that we have in Benedict's qualitative solution, one that is stable, easily procured; a test anyone can make in a short period of time.

Method: Eight drops of urine added to 5cc of the solution placed in a test tube and boiled for two minutes. The presence of glucose is demonstrated by a change in the capacity of the solution, ranging from a greenish haziness to that of a vivid red. A negative finding should not be considered unless the solution remains clear enough for printed type to be read through it. This test rules out all reducing agents except lactose, pentose and homogentisic acid.

Quoting from E. C. Dodds of the University of London, who says "That homogentisic acid is so rarely found in the urine that it may not be considered," we have eliminated uric acid, creatinin and glycuronic acids as factors.

It now remains for us to fall back upon another well-known test, namely, the fermentation test, one which has this disadvantage, that some yeasts fail to ferment glucose and others produce fermentation without the presence of glucose. Dr. Castellani of New Orleans says that he has isolated a strain of parasitic fungi, which will produce gas with only levulose or glucose, hence, for practical purposes it is better than baker's yeast.

Fermentation method: This consists of three fermentation tubes; tube No. 1, rub a small piece of baker's yeast in the suspected urine, then fill the closed arm of the tube with the urine, being careful to exclude all air bubbles; tube No. 2, repeat the procedure, using water instead of urine; tube No. 3, use the same amount of yeast and diluted glucose

solution. Place the tubes in a warm room over night. The presence of gas in tubes No. 1 and No. 3 and none in No. 2 indicates glucose. In the event there is a positive Benedict's and a negative fermentation reaction, we must proceed to rule out lactose and pentose.

In laetosuria we have usually the history of exclusive milk diets, nursing mothers or breast-fed children, while in pentosuria there is as a rule the history of eating large amounts of cherries, apples, plums or beets. It is said that pentose is often present in diabetic urines and this is no doubt dependent upon the ingestion of pentose-containing foods.

If pentose is suspected it can be detected by Bial's test, which is as follows: 500cc of 30 per cent hydrochloric acid, to which is added one gram of orcin and 25 drops of ferric-chloride solution; 4 or 5cc of this reagent are heated to boiling and removed from the flame. The suspected urine is then added drop by drop, not exceeding 1cc in all. A green color should appear immediately if pentose is present.

If negative for pentose, then lactose may be detected by Rubner's test, which is not very delicate and shows lactose when the quantities exceed 0.3 per cent to 0.5 per cent. Method: 10cc of urine are treated with an excess (3 grams) of lead acetate and boiled for a few minutes. The yellowish or brown solution is then filtered and ammonia added to the filtrate until a slight permanent precipitate remains. An intense brick-red fluid is obtained which later shows the deposition of a cherry-red precipitate, with a colorless supernatant fluid. Glucose gives with this test a red solution, but a more distinctly yellow precipitate.

A more accurate test for lactose would be to prepare an osazone, according to a method used by E. C. Dodds of London, which is as follows: About 50cc of urine are measured into a test tube, and 1cc of glacial acetic acid is added, enough phenylhydrazine hydrochloride as is required to cover a six-pence is added, and this is followed by a slightly more sodium acetate about as much as is required to cover a ninepence. The tube is placed in a boiling water bath and after half an hour heating the contents are filtered and then allowed to cool, when the characteristic crystals separate.

The presence of glucose in the urine being definitely settled it is well to review the normal percentages. Many of our large insurance companies are accepting urine sugars up to 0.2 per cent as being within the normal range.

Marsh (1) states: "That in normal subjects the kidneys are able to prevent the pas-

*Read before the Jefferson County Medical Society, May 20th, 1929.

sage into the urine of any significant part of the .1 of 1 per cent of glucose that is in the blood stream, and that this balance may be upset by any abnormality on the part of the kidneys or the blood."

We can be safe in the assurance that any urine containing more than 0.2 per cent glucose should be classified as pathological, provided the reduction has been made by a standard test, the accuracy of which cannot be questioned.

Abnormal glycosurias demand attention not only from a laboratory check-up, but also require thorough physical examinations. It is not necessary to add that a good case history report may determine the diagnosis.

The question to consider, are we dealing with a true diabetic or to that group commonly termed the nondiabetic glycosurias? In reference to this last grouping they are to be divided into those presenting hyperglycemia and the types constantly maintaining normal ranges of blood sugars. Such a differentiation can be easily made by what is called a glucose tolerance test, which is as follows: No food of any kind after supper the evening before. Procure a freshly voided specimen of urine and examine for glucose. Obtain about 5cc of blood and estimate the amount of glucose in 100cc of blood. Then give for each kilogram of body weight 1.59 grams glucose dissolved in two and one-half times as much water as grams of glucose to be used.

Run a blood sugar at thirty-minute periods, making the last at the end of two hours following the administration of the test. If the blood sugar preceding the test was normal and the curve does not exceed from 150 to 180 mgs., also the reading made at the closing two-hour period proves to be within the normal range, such findings should be considered normal, and the presence of sugar in the urine preceding the test or appearing during the examination classifies the type as a nondiabetic glycosuria without hyperglycemia.

Whereas, those types presenting a sudden rise in the blood sugar curve within the first hour following the tolerance test, reach heights of 180 to 200 mgs. or more, but returning to a normal range in two hours' time, which is from 80 to 120 mgs. per 100cc of blood. These are classified as nondiabetic glycosurias with hyperglycemia.

In discussing such glycosurias we shall first consider the type producing normal sugar curves. McCrudden (2) states: "This form may occur from certain drug poisoning, such as phloridzin, mushrooms, cantharides, etc., and the glycosurias of pregnancy, although the latter may be alimentary or renal glycosuria."

Renal glycosuria, to substantiate the fact

that we are dealing with such a condition, Straus has given four rules to govern same, as follows:

1. There must be glycosuria without hyperglycemia.

2. The glycosuria almost entirely independent of the carbohydrate intake.

3. Absence of diabetic symptoms.

4. No subsequent development of diabetes mellitus.

Nondiabetic glycosuria with hyperglycemia, McCrudden (3) has presented some interesting reports of alimentary glycosuria, quoting from various authorities.

- (a) The initial rise in the blood sugar concentration has been detected in ten minutes after the ingestion of glucose.

- (b) Time of maximal concentration, found by the greatest number of observers to be around thirty minutes after ingestion of glucose.

- (c) The greatest maximal concentration was around 0.14 per cent and above 0.16 per cent was found to be unusual. However, one case was reported as high as 0.42 per cent.

- (d) All investigators agree that the duration of the curve above normal lasted from one and one-half to two hours in normal postprandial glycosurias.

A most interesting description of alimentary glycosuria is given by Dr. Phil L. Marsh (4) in which he says, it should be restricted to that group in which sugar appears in the urine of normal subjects because of the excessive intake of sugar. However, if the administration of glucose is no more than would be tolerated by the normal subject and glycosuria appears, then it is not alimentary but due to some defect in the metabolism or mobilization of the carbohydrates. The ingestion of starch, which is slow of absorption, should not produce glycosuria in the normal person.

The lesson to draw from these conclusions is: That any person can and does have sugar at times in the urine. We are living in a period where rich foods, pastries and enormous amounts of candies are being consumed. I have no doubt that from year to year there will be a greater increase per capita. Whether this strain upon the pancreas, due to an increasing demand for sweets, will result in a race of diabetics remains to be seen. We should not be too hasty in pronouncing some of our patients diabetics simply from the fact that one or two urinalysis reports have disclosed the presence of sugar.

Nondiabetic glycosuria with hyperglycemia may result from anaesthesia, administration of drugs, such as morphine and adrenalin, acute infectious diseases, brain injuries and tumors, cerebral syphilis, encephalitis, thyrotoxicosis, etc. Also emotional disturbances,

as in fear, rage, fright and pain. Periods of great excitement or depression, as in the insane and the so-called psycho-neurosis. For the same reason in occupations requiring great mental activity. Students examined after difficult tests not infrequently show sugar in the urine. Glycosuria has been found in football players following the excitement of championship games.

Kilduffe (5): It is said that the blood sugar is increased just before the menstrual period and returns to normal when the flow stops. It may be reduced in starvation and from prolonged muscular exercise. Addison's disease, cretinism, myxedema, cancer of the intestinal tract, pituitary disease, and in dropsical conditions due to the abstraction of sugar by the fluids in the tissues.

Marsh (6) claims not over 2 per cent of all various types of hyperthyroidism are subject to glycosuria. In the examination made of eight or ten exophthalmic goitre cases, to whom were given routine glucose-tolerance tests, the respiratory quotient showed they burned 35 per cent of their glucose, while in a similar number of control cases only 20 per cent was oxidized. This clearly demonstrates that there is not an inability on the part of the organism to burn sugar in thyro-toxicosis but that there is a decreased tolerance to glucose.

These types produce sharp, rapid elevations in the blood sugar curve with a corresponding rapid fall. The respiratory quotient, if taken before and after a meal, shows a rapid rise to a fairly high level, thus ruling out diabetes.

The threshold is not present in renal glycosuria, a seepage of sugar through the kidneys may appear at any point in a normal concentration of the blood sugar, and the glycosuria is not dependent upon the amount of food eaten. A marked contrast is present in hyperglycemia and diabetes, in which the blood becomes surcharged with sugar, finally breaking down the repelling force exerted by the kidneys; as a result glucose appears in the urine.

The height in the blood sugar elevation necessary to produce this overflow is called the renal threshold. The exact figures can not be given where such a point may be reached in the curve. Usually any degree over 180 mgs. represents the kidney threshold. This varies constantly in each individual and in some old diabetics over 300 mgs. may be reached before glycosuria.

I have a patient now under treatment at the St. Joseph infirmary in whom the blood sugar reading was 320 mgs. with no glycosuria. This high threshold is attributed to the fact that pyuria is present with a possible pyelonephritis. A culture made from

the urine showed a colon bacilli infection. A two-hour phthalein estimation was made, and the findings were 49 per cent dye. Probably the controlling influence in producing high thresholds is generally due to chronic nephritis or some renal impairment.

A diagnosis of diabetes mellitus is dependent upon the appearance of a hyperglycemia, and if this condition exists there is a rise to abnormal heights in the blood sugar with a subsequent delay in its fall, often covering a period of from four to five hours.

All glucose tolerance tests must be made upon fasting individuals. If the blood sugar concentration returns to normal in two hours' time following the test, diabetes is not present. It is not essential for glucose to appear in the urine during a testing period to clinch a diagnosis, although glycosuria is usually the ever-present symptom. Consideration should be given to the fact that mild diabetics, if examined before breakfast, often have normal blood sugars.

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DISCUSSION

R. Hayes Davis: The essayist has covered the subject so fully there is little left to be said. I may emphasize a few points that may be of some practical value. When a patient comes for diagnosis and has a small amount of sugar in the urine, the first practical step is to make a blood sugar test to determine whether it is normal or elevated. That is of far greater importance than the quantity of sugar in the urine—which is of little importance except in certain cases. If the blood sugar is normal, the next practical step is to make a sugar tolerance test, as that will determine whether or not the patient has diabetes. If he is not a diabetic, then it is of interest to have him take a large meal composed of a considerable quantity of carbohydrates to determine whether the sugar is of appreciable quantity or not, for some of these cases will have a large amount of sugar in the urine with normal blood sugar. In certain instances it is of some practical interest to determine the actual quantity of sugar in the urine, but in the majority of cases that is not of very much importance. We have two conditions that are of importance, one is diabetes and the other is renal glycosuria. The diabetic has a high blood sugar or blood sugar above the normal level. In renal glycosuria although the patient may show sugar in the urine of appreciable quantity, his blood sugar remains normal, sugar tolerance test normal, diet does not have any great influence on the quantity of sugar in the urine, and he

has no symptoms of diabetes. Hyperglycemia does not always mean true diabetes, and is usually easily differentiated, and it is of minor importance in comparison with primary disease. For example, if you have a patient with exophthalmic goiter, who is showing very decided symptoms of thyrotoxicosis and also hyperglycemia and some sugar in the urine, the hyperglycemia or glycosuria is always of secondary importance, and as soon as the thyrotoxicosis has disappeared the secondary condition subsides as well. This is also true of other conditions that were so completely covered by the essayist.

William A. Jenkins: The presentation of the essayist is timely and contains a wealth of common sense. It is very evident the day has long passed when we can class this question of sugar in the urine as a very simple matter. There was a time when the average medical practitioner believed only one simple test was necessary to determine whether or not the patient was suffering from diabetes, (and that was the finding of sugar at a single haphazard examination of the urine), and this belief still exists in some quarters. A few years after that physicians became convinced that it was the constant presence of sugar in the urine that meant true diabetes. Still later we discovered that we could have sugar in the urine from alimentary tract conditions, renal glycosuria and true diabetes (Pancreatic insufficiency). This whole proposition at the present time is not nearly so simple a matter. Even the question of classification has been torn up a little. I hope the essayist will mention that in closing the discussion. Some of the more modern authorities are recording instances in which diabetes and renal glycosuria are supposed to be present in the same case. Arguments have also been made as to whether or not there may be some question as to these two things being perhaps different phases or different stages of one and the same metabolic problem. I am not really sure myself, but this may perhaps be the best explanation of a great many curious and irregular types of glycosuria occasionally seen. The feature that impresses me as being worth while about this proposition is not only to determine the cause and type of the disease, but to confirm in every way we can how the human body stores, utilizes and burns up carbohydrate material.

We are making great progress along the line of metabolic studies and this in connection with our studies of the blood and urinary sugar curves, plus a careful evaluation of the clinical phenomena which the individual case manifests, we can usually arrive at a definite and correct conclusion as to the significance of sugar in the urine. However, this cannot be done in a short time or by using careless methods. It usually requires care, time, painstaking methods and the utilization of all the modern methods of investigation, including a careful clinical study of the

case, to determine the significance of sugar in the urine.

Virgil E. Simpson: One of the things of particular interest in this connection is that percentages mean very little from the standpoint of the presence of sugar in the urine, except when we have the twenty-four hour urine output upon which to base our percentages. In other words, everything depends on the amount of urine the patient eliminates with reference to the percentage of sugar present. If the patient eliminated one hundred ounces of urine a day with examination of 10 grams of sugar, that gives a certain percentage of sugar, whereas if he is eliminating only twenty ounces, the percentage is markedly increased as the concentration is greater. One of the things, therefore, that we must bear in mind in thinking in terms of sugar in the urine is the twenty-four hour output of urine.

Another feature of considerable importance from the standpoint of closer study of cases, is determination of the amount of sugar at each voiding, even if the twenty-four hour specimen is held for study. Each individual specimen as voided, may show considerable variation in the amount of sugar lost. Some may be sugar free, whereas others may show a large quantity of sugar.

Another feature of considerable importance from the standpoint of sugar in the urine is study of the blood sugar curves. This also has an important bearing on the renal threshold as mentioned by the essayist. If there is any appreciable degree of nephritis there is likely to be a corresponding rise in the blood sugar findings. The blood sugar level is a fairly dependable criterion, as one of the functional tests, in studying nephritic conditions and the degree of the nephritis can thus be fairly well estimated by the height to which the blood sugar rises. A rise to the height of 160 or 180 in a non-diabetic patient means nephritis with marked impairment of function. What do we mean by renal threshold? It is the point to which the blood sugar may rise without sugar appearing in the urine and it varies with the individual. Any level between 120 and 180 after meals may be considered a normal blood sugar finding. In a normal individual with a normal threshold, when the blood sugar reaches a level of from 160 to 180 no sugar appears in the urine. In the same individual when the blood sugar reaches a point higher than that sugar does appear in the urine. It means the highest level at which the organism is able to hold back the sugar in the blood without any of it passing over into the urine. In practically all normals at a level of 160 to 180 no sugar appears in the urine, where the sugar reaches this level after an ordinary meal. When the blood sugar becomes higher than the individual's threshold then sugar appears in the urine. The level, then, at which blood sugar

flows over through the kidney into the urine is of considerable importance from diagnostic and other viewpoints. As the renal threshold varies in health, it must necessarily vary in diabetes and in kidney lesions as well. If the normal threshold is 190, with a normal kidney in a given individual when that individual becomes diabetic he will have a higher threshold than the average.

A patient in good health with a renal threshold of 180 will eliminate a sugar-free urine. When he becomes a diabetic his blood sugar rises above 180 and he presents a glycosuria. If later a nephritis develops the permeability of the renal cells to sugar is impaired and his renal threshold may be raised, in consequence, to 200 or more below which level of blood sugar, no urine sugar would be found.

George A. Hendon: I would like to ask the essayist if, in the presence of nephritis or other renal lesion in which sugar is increased, if that individual is any more likely to develop glycosuria than a normal person. In other words, can the nephritic take care of as much sugar as one who is not nephritic?

L. Lyne Smith, (in closing): I certainly appreciate the discussion of my paper here tonight.

With reference to renal glycosuria as mentioned by Drs. Davis and Jenkins, the general opinion is that we know very little about it, and I feel sure no one admits that the ingestion of considerable amounts of carbohydrates particularly influences the condition.

Some interesting experiments have been made, notably that of Schneidemann in reporting his own case, in which he found that upon the ingestion of as much as 500 gms. of glucose, the urine would show sugar in 20 minutes, but if 1-100 grain of atropin sulphate was administered hypodermically within 5 minutes of taking the glucose, no glycosuria resulted. If the drug was delayed for 20 minutes, glycosuria was found. If exercise is taken at once after eating carbohydrates, no sugar appears in the urine, but if delayed for 20 minutes glycosuria occurs.

Inhalation of oxygen if taken within five minutes after the intake of glucose, no glycosuria, but if delayed for 20 minutes it appears. Just why such results were obtained is hard to explain, except that the rapid rate in which glucose appears in the urine would suggest some hepatic interference, which was overcome by exercise and inhalation of oxygen.

We know that atropin exerts a depressing effect upon the vagus nerve endings, hence this suggests some vagus interference with the liver cells, and again the nerve terminals in the tubules of the kidney may be influenced by toxins and other agencies, which offers an explanation for the presence of renal glycosuria.

The toxemia of pregnancy probably affects the terminal nerves in both the liver and kidneys. Thus again offering an explanation for some of the glycosurias of pregnancy.

Dr. Jenkins spoke of renal glycosuria and diabetes occurring together. If we can accept the fact that toxins do affect the nerve terminals in the kidney tubules, then I see no reason why both conditions cannot exist together.

As to the percentage of sugar in the urine when the intake of water is restricted, if the diet has been an average one, necessarily, the percentage of glucose per 100 cc. of urine will be greater than if large amounts of fluids had been ingested. A quantitative analysis of the twenty-four hour urine should show the same amount of sugar with or without the excessive intake or restriction of fluids. The time in which sugar is found in the urine may mean a great deal. If it appears in the night urine, we have the right to assume that the glucose may be due to the morning and noon meal. If in the morning urine taken before breakfast we should look to the supper meal as the cause, hence either the diet must be changed or the insulin administration increased to meet the indications shown by the morning and night urines.

Dr. Hendon has asked if a nephritic can take large amounts of glucose without injury. It has been my experience that diabetics as a rule have casts, albumin, and often red blood cells in the urine. If upon a well regulated diet, the patient becomes sugar free, and the blood sugar has been reduced to somewhere near the normal range, these urinary findings then usually clear or are considerably modified. For this reason I think large amounts of glucose administered to a nephritic would be contraindicated.

Intramuscular Injections of Camphor in Treatment of Engorgement of Breasts—Experience has convinced Philpott that camphor has a definite inhibiting action on the secretion of milk. Camphor in oil was the sole form of medication employed by him in eighty cases. A loose Indian binder was used in an occasional case to support pendulous breasts, but no form of pressure binder was used at any stage. Intramuscular injections of camphor in oil were given, 1½ grains (0.1 Gm.) to a single dose. The first day two injections were given, with one daily injection the following three days. In any patient who was not intended to nurse on account of a stillborn baby or owing to some other cause known at the time of delivery, it was found advisable to start this treatment the first day after delivery. Injection of camphor in oil is a far simpler and less painful method of treatment than that of applying tight binders, local applications of ice, or the administration of large doses of magnesium sulphate.

SYNOPSIS OF TUBERCULIN IN TREATMENT OF TUBERCULOSIS*

By E. McD. TRABUE, M. D., Louisville.

Tuberculin, although sometimes called lymph, is not a serum, nor derived from serum, but is a product of bacterial growth upon one of several culture media. The term tuberculin denotes a group of preparations, which are known individually as tuberculins, but with some qualifying word or phrase, as Old, New, etc. Some tuberculins, however, are designated by terms less indicative of their true nature, as Tuberculol, Endotin, etc. All tuberculins though whatever their individual names and however subtle their process of manufacture, have this basic factor in common: They are derived from cultures of tubercle bacillus. The varied qualities of the various tuberculins are obtained by cultivating varying types of bacillus, by allowing the growth to continue for varying intervals of time, by subjecting the substances used to various biological, electrical, chemical or physical influences, and by using all or only part of the substance present in the culture tube at a given time. And finally, whatever the method of preparation and the character of the end product, care is taken that it contain no living tubercle bacilli.

In order to more readily appreciate the efforts of those who have sought an ideal tuberculin and to appreciate the astounding number of products presented, an attempt will be made to group those which have to date seemed to offer greater proof of worth as follows: Group I, containing the tubercle bacilli themselves, subjected to only slight changes, consists of Bazillen, Emulsion, or B. E., Behrings Vaccine, Tibeau and Tuberculo-Sero-Vaccine. Group II, consists of tuberculins made by extracting tubercle bacilli without any attempt at isolation of ultimate principles and would include New Tuberculin or Tuberculin Residue, Bieraneck's tuberculin, von Ruck's watery extract and those derived from the fatty substance of the bacilli. Group III, consists of preparations derived from the culture fluid, as Old Tuberculin O. T., Bouillon Filtrate or B. F., Jocheman's tuberculin and tuberculin Purum or Endotin. Group IV., consists of modifications which aim at the isolation of pure principle, and while these might be placed in one of the other groups it is intended to indicate an effort at a far-reaching analysis with chemical purity as a goal; These are: Tuberculol; Tuberculocidin; Haentjen's Filtrate and Tuberculo-Nastin. Group V., is of tuberculins which in so far as the method of preparation

is concerned might properly enter certain of the preceding groups, but on account of the fact that they in each case utilize a distinct type of bacillus, it would seem that they should be grouped as such and are Spengleins tubercuhns; Calmette's, the tuberculins made from avian, piscian and other acid fast bacilli and the autogenous tuberculins.

Without exception the tuberculins mentioned have been tested by animal experimentation, and for each it has been claimed that a certain degree of immunization can be obtained in animals, and for most of them also excellent results in human therapy have been claimed by their makers. Any careful study of the literature and reports relative to the evidence that has been presented of their immunizing effect must convince us, however, that much of the work has been uncontrolled and the only reports available upon some of the tuberculins are by their inventors; and therefore in this resume, by any later reference to so-called Tuberculin we shall intend the reference for those which have by actual clinical use proven their efficacy in the production of some degree of immunity in the human subject.

In discussing the results obtained by the use of tuberculin we shall largely ignore numerous varieties. This may well be done on account of the great similarity between the composition of many of them and the comparative inefficiency of many of the remainder.

It is true that the reported results obtained in the years immediately following Koch's announcement of his cure are not merely discouraging but actually repulsive. It is, however, no less true that to consider the date of those years as contraindicating modern tuberculin therapy is to admit ourselves either unaware of the vast difference between the two eras or hopelessly biased, for not only were Koch's cautions as to the careful selection of cases grossly ignored or misunderstood, but he himself used a method of procedure which is at present nowhere in vogue. However interesting the historical data, they need not be mentioned here for our present wish is to know of the therapeutic results from the use of tuberculin as it is now used, restricted to patients whom we now consider fit, exhibited in doses that we now believe safe, and so graduated as to obtain effects which we now know are not only harmless but beneficial. We must therefore accept in evidence only the statements of those who have used tuberculin, not of those who, believing it dangerous, have never tried to use it.

After a discriminating study of the evidence presented by the modern users of tuberculin, we believe this deduction inevitable: Tuberculin is not a "cure" for tuberculosis,

*Read before the Jefferson County Medical Society, June 17th, 1929.

any more than is rest or diet or climate and hygiene, or any other favorable factor, and that in making this comparison we have concisely stated just what tuberculin has proven to be, namely not a "cure," but a favorable factor. Whether it is a more or less favorable factor than rest or fresh air for instance we do not know. However, until we find some one thing that, in itself, and without any other measures will cure, until then we must not ignore any helpful factor available.

In summarizing the results which may be expected from the administration of tuberculin it is of interest to note reports relative to effect proven upon the sputum, by men who have devoted many years of their lives to the study of tuberculin.

Kremser reports a series of 110 cases, incipient and moderately advanced, treating 55 with tuberculin, and a like number without assigning them alternately to these two classes upon admission. Of those treated with tuberculin, 22 or 40 per cent lost the bacilli while those who did not receive tuberculin only 16, or 29 per cent were rid of the organism.

Phillippi reports that in his moderately advanced cases, 58 per cent of those treated with tuberculin, as against 19 per cent, who did not receive it were freed from bacilli, and in his advanced cases, 31 per cent of the tuberculin treated as against only 7 per cent of the untreated.

Turban reports that of 86 open cases treated with tuberculin 47.7 per cent were closed, while of 24 untreated, only 27.4 per cent resulted in loss of bacilli.

Brown reports from Saranae that in the incipient class 67 per cent of the open tuberculin patients were closed. Non-tuberculin patients 64 per cent. In the moderately advanced tuberculin cases 44 per cent lost their bacilli, non-tuberculin treated, 24 per cent.

Bandelier, reporting 500 cases of whom 202 had bacilli, divided as follows: Incipient 12, moderately advanced 77, advanced 113, claims 100 per cent of the incipient, 87.3 per cent of the moderately advanced and 50 per cent of the advanced cases closed after an average treatment of from 5 to 6 months with tuberculin, and challenges the production of similar or better results without the use of tuberculin. We believe they are unparalleled in literature.

In determining the effect of tuberculin upon individual symptoms self delusion is easy, however current literature bears me out in asserting that the sense of well being in tuberculin patients is the most striking single feature and is truly remarkable. The body weight is not particularly influenced, and if weight is to be considered a criterion, super-alimentation is more effective. Mild pyrexia

may be favorably influenced by tuberculin. An irritative non-productive cough tends to abate rapidly unless due to some local condition as notably in the nasopharynx, such conditions require appropriate treatment. Expectoration yields gradually. Where it has been profuse we should not expect a sudden change which is also true of the expectoration of tubercle bacilli. These disappear slowly, but in the majority of cases more rapidly than without tuberculin. We do not know of any specific effect upon hemoptysis, although Brown's statistics seem to show very little evidence of bleeding in tuberculin patients.

The appetite and digestion are usually decidedly improved in so far as they have been impaired by toxæmia. Dyspnea also, in so far as it has been due to toxæmia and not to actual tissue destruction nor emphysema, is improved. If there has been a tachycardia proportionate to the weakened systemic condition, it improves correspondingly. If however the tachycardia is out of proportion to the general debility there is presumably some defect of the myocardium and is likely to be protracted. Pleurisy, either with or without effusion is uncommon in tuberculin patients, although it does occur. We have seen such pleurises where the patient seemed to be doing most excellently in other respects.

Pulmonary tuberculosis in children has been less thoroughly studied than in adults, until comparatively recently. There has been, too, a strong prejudice against using tuberculin in young children, supposedly on account of what has been thought to be their hyper-sensitiveness. Numerous writers, however, report very favorable results where the lesions are not extensive nor extremely progressive. Excellent results are obtained in those children who have been exposed to infection in their homes and who are pale and weak, but with no definite physical signs; apparently just subnormal, but who present positive cutaneous reactions. Such children probably have tuberculous glands and do splendidly under tuberculin.

Since the action of tuberculin is specific, there is no reason for not employing it in the treatment of tuberculosis in any organ. The only contraindication for its use in any situation is the consideration of the possibly harmful results following a too severe focal reaction. However, since by following modern technique and dosage a strong reaction can be avoided, there is no apparent reason for not using tuberculin against tuberculosis in any part of the body.

Next to the lungs, the larynx seems to have been most frequently treated. An advantage in the treatment of the larynx is the visibility of the organ, which permits more exact control of the reaction. A disadvantage however

exists in the fact that tuberculous laryngitis is secondary to pulmonary tuberculosis and therefore that our treatment of the larynx must be regulated not by the dose required by the larynx but by the dose which the lungs will tolerate. It not infrequently happens that the pulmonary lesion, perhaps not being apparent, is not recognized or is neglected and for that reason the treatment of the larynx proves disappointing. There is also the possible danger of oedema of the larynx from a violent focal reaction, but with modern methods, this catastrophe should not occur.

In the realm of surgical tuberculosis, tuberculin has been most frequently resorted to in the treatment of tuberculous lymph-glands, in both adults and children. Those glands best suited to tuberculin therapy are the ones which have not softened. Where softening, or fistula is already present, surgical measures are of course necessary, but need not be as extensive if tuberculin is to be used subsequently. On account of the usually exposed position of the focus the reaction can be easily watched, and thereby the dosage accurately regulated. The prognosis is much better than in laryngitis, because fewer of the gland cases are complicated by active pulmonary disease.

In the treatment both of grave and minor lesions of the eye, most fortunate and surprising results have been obtained. Lesions in every part of the eye have been reported as undergoing marked and permanent improvement. Vision has been restored after having been seriously impaired and eyes are being saved which had apparently been destined to enucleation. Among the lesions successfully treated are tuberculous keratitis, scleritis and episcleritis, tuberculosis of the conjunctiva, iris, ciliary body, choroid, retina and hyaline body. The focus of the disease being visible, there should be little difficulty in dosage, thereby avoiding reactions, save the very mildest.

In bone and joint tuberculosis, as in glandular tuberculosis, there is a growing and well founded opinion that surgery may be most happily supplemented by tuberculin.

The prognosis in tuberculosis of the genito-urinary system depends largely upon the accompanying pulmonary lesion and upon the extent of the local process. There is, it is evident from the literature a widely extended and it seems increasing recognition of the value of tuberculin, as an adjuvant, but discussion rages as to when or to what extent surgical interference is advisable. There can be no doubt that surgical intervention is unfavorable in many instances, and it is apparent that more and more it is the feeling of surgeons that general supporting and up-building measures are not sufficiently pushed before resorting to surgery. Halstead has

notably been most insistent upon this view in the treatment of surgical tuberculosis and especially those lesions involving the genito-urinary tract. Here it should be remembered that among supporting and stimulating measures, tuberculin takes highest rank.

Lupus is notoriously resistant to all known therapeutic measures. From a very early time tuberculin has been used. Koch himself, as have many writers since then, reported success with tuberculin. It is apparent, however, from a general view of all available evidence, that many cases refuse to heal even with tuberculin. It would seem therefore necessary for treatment to include all known remedies and devices. Tuberculin is especially indicated, where the process is deep or where it involves the mucous membranes, rendering excision, curettage or fulguration extremely difficult. There is no reason, however, why the aid of tuberculin should not be sought even in the mild cases.

In deciding which patients, with tuberculosis are fit for tuberculin therapy, and which are not we must bear in mind always, that tuberculin is not an antitoxin. It does not neutralize or inhibit any toxin, we are sure; nor is it a bactericide in the sense of directly or immediately attacking the organism. It would seem, however, that tuberculin acts by stimulating the natural resources of the body, available at the time. We therefore, conclude that tuberculin can be of no avail if the natural resources of the body have already been exhausted, and the converse of this conclusion is that every case of tuberculosis is fit for tuberculin therapy, unless the patient is actually incapable of therapeutic stimulation.

Mild fever is in itself not a contraindication for tuberculin, if the nutrition is good. A rapid pulse in a tuberculous patient demands rest in bed, and active treatment of the underlying cause. If the fever persists, tuberculin may be wisely tried. In the treatment of advanced and even of moderately advanced cases, it should be remembered that it is not so much the extent as the activity of the lesion which makes treatment difficult.

In closing, as in opening this brief summary of tuberculin therapy, we would reiterate the fact apparent from a study of available literature that tuberculin should in no wise be thought of in its present stage of development, as a "cure" for tuberculosis in any form, but should be thought of and made use of, as a most favorable factor in our consideration of treatment, just as is rest, and diet, and climate.

DISCUSSION

William A. Jenkins: When Koch introduced tuberculin in 1890, it was hoped and expected that it would be the long-looked-for cure for tuberculosis. As a consequence of that expecta-

tion, it was immediately accepted by the medical profession and used indiscriminately as a therapeutic agent in large doses and in all types of cases. The results, as might have been expected, were disastrous. Active cases inflammatory in type were made much worse, localization increased and many patients died. As a result of this first experience with tuberculin the pendulum swung back from extreme enthusiasm to the point where the agent was almost discredited. Then the matter was investigated more seriously by men who devoted all their time to the study of tuberculosis, and the pendulum is now beginning to swing back again from doubt to advocacy.

I think the reasons for the confusion and misunderstanding are quite obvious. We were giving a substance the exact nature of which we did not understand. We knew very little of its practical use and did not know exactly what results might accrue from its use. Therefore we were working more or less in the dark. We had no definite scientific standards to go by. We could not gauge the therapeutic activity, the physical influence or the antibody formation stimulation that this substance might produce in the cells of the host when introduced. We know it was a proteid derivative from the tubercle bacillus obtained in various ways according to the fancy of the original investigators. We learned that it could cause a reaction provided there were tubercles anywhere in the body of the host, also that it could be given almost at will in large doses to an individual who had no tuberculous taint without producing any reaction. Thus we came to know that in some way tuberculin had some influence on tubercles in the human body; we introduced it and it caused a reaction. That reaction may be local at the site of injection, focal at the site of infection, or sometimes general. Any one or all these types of reaction may be noted in a given case.

We have finally arrived at the point where we know tuberculin is considered for two particular purposes: First, that of a diagnostic agent by obtaining a tuberculin reaction; second, as a possible therapeutic agent in tuberculosis. It was not considered, as the essayist has stated, in the early days that tuberculin immunized anyone against tuberculosis when introduced into the blood serum of the host. That is to say, it did not stimulate antibody formation as we now understand the nature of antibodies, but it produced a reaction where tubercles were present in the body, because experiments have been performed on animals which were later killed and at the site of tubercles in the body there have been found present cellular changes, an infiltrative process, swelling inflammatory in character, showing that nature had attempted to wall off the area by changing the reaction of the tissues and combating the influence of the tuberculous process in the body. That was a hint for tuber-

culin treatment.

This substance should be used by one who understands not only tuberculosis in general and all its variations in activity, but he should have had a large experience in handling tuberculous cases and understand what we now know regarding tuberculin. In the hands of such an individual it is an agent worthy of our consideration.

The results in some forms of tuberculosis, particularly of the glandular structures, the eye and the skin, have been most gratifying. These are low-grade infections and are not commonly accompanied by acute inflammatory phenomena. In some forms of pulmonary tuberculosis, even in the presence of an inflammatory process with breaking down of the tissues, if the destructive process is not too severe, our duty should be to give very small doses of tuberculin. We may thus raise the vital resistance of the individual, and his powers are very much increased by the appropriate and proper use of tuberculin.

A great deal of work is being done abroad just now with tuberculin. Of particular interest along this line is the work that has been done recently at the University of Oslo in Norway. They have been working with the B. C. G. Tuberculin (the Bacillus Calmette Guérin Tuberculin). This tuberculin, as you know, was first prepared by Calmette. He took a strain of Bovine tubercle bacilli and markedly attenuated them by carrying them through endless generations, which required years of time. This B. C. G. Tuberculin was used in the University of Oslo for the purpose of producing an immunity to human tuberculosis. They found that the product would apparently produce an effective immunity against human tuberculosis. They took a large group of nurses, who reacted negatively to the ordinary tuberculin test, and after inoculation with the tuberculin B. C. G. type these same nurses would after a time give a positive reaction to the ordinary tuberculin test, and that these nurses thus prepared or treated did not contract tuberculosis while working on the wards.

It is now being suggested that this product may be found useful in the treatment of tuberculosis. This whole matter, however, is still *sub judice*. It has not advanced to the stage where any scientifically accurate or positive statement can be made concerning it.

Virgil E. Simpson: The essayist used the term "modern" with reference to his conception of the use of tuberculin. I take it that he had a very simple procedure in mind. There is nothing particularly complicated about the so-called modern use of tuberculin. It simply means a dosage that the patient can tolerate without harmful reaction, it means the lapse of a proper interval of time between doses, it means a progressive increase in dosage, and it means finally and equally important a proper and sensible and judicious selection of cases in

which to use it. That is the modern use of tuberculin. It is not astonishing, as has been said, that tuberculin as used originally, promiscuously, indiscriminately, in all sorts of cases, in every stage of progress and activity, should have resulted disastrously. If the patient has fever if activity is increasing, if there is marked expectoration, these are contraindications for the use of tuberculin. That is not the modern conception of its use. That patient is more suitable for the old-time but time honored methods of treatment. The elevation of temperature is not due to the tubercle bacillus, so much as it is due to a mixed infection, and the administration of tuberculin at that time is not wise, just as it is ordinarily unwise to give vaccine in an acute infection.

As to the dosage to be used: As we think of tuberculin in the dosage of today, the dosage used originally was little short of heroic. The dosage today is almost infinitesimal to start with. The dosage is determined by the degree of reaction that the patient shows. The rule is to administer a dose sufficiently small that no reaction is observed clinically. Each consecutive dose is increased cautiously and gradually, and when given in that way it will produce no clinical manifestations. To give it, as I have seen it administered, every day, is rank therapeutic nonsense based on our conception as to what tuberculin may do.

It is interesting to consider just what tuberculin is and just what it does in those cases in which it is administered. It is not an antitoxin, it is not a vaccine, it acts as neither of these agents, that is, as a specific. It does not produce any sort of immunity, but I think of it as raising the level of tolerance when administered in suitable and graduated doses. We know, for example, that we can start a patient on the minimum dose of arsenic and gradually increase the amount until after a while enormous doses are tolerated without apparent harm. Habitués take enormous doses of opium with little apparent ill-effects. I think of tuberculin not as having any direct therapeutic action, not as raising the level of immunity, not in any sense creating immune bodies, but as raising the level of tolerance.

Patterson has made use of this idea in England in a very interesting and unusual fashion. He conceived the idea that tuberculin did raise the level of resistance, and his theory was to make the patient manufacture his own tuberculin, that is those who were apparently doing well, not bed-ridden patients with cavitation, etc., so he inaugurated the scheme, which was original with him, of creating a new and novel system in the management of his hospital cases. I have visited his hospital and it is as interesting as it is marvelous from the standpoint of hospital progress in some of its phases. He desired

originally to have his patients perform a small amount of manual labor, depending on their physical condition, reaction, temperature, etc., to be followed by a period of rest under his direct control. He had them carry stones for short distances and place them in piles. The next day perhaps he would have them carry the same stones to some other place, and so on. He finally conceived the idea that this was labor wasted and decided to use it for the benefit of the hospital surroundings. The English people are wonderful landscape artists and Patterson was an original thinker. Under his direction his patients beautified the hospital grounds. They made flower gardens, planted shrubbery, graded lawns, and did many other things to make the place wonderful. All this labor was performed under Patterson's direct control, the patients taking a definite amount of exercise by doing manual labor followed by rest. I believe this is a perfectly sound procedure. It is difficult to follow this plan with our private patients.

We are using tuberculin in selected cases, and when properly used on, as has been said in a modern way, in a properly selected group of patients, with a proper conception of what tuberculin can do and a proper appreciation of what it is doing in the patient and what it is not doing, there is no question about this agent having a definite field of usefulness.

I have seen several cases of eye tuberculosis materially benefitted and it so happens that one such is now under observation. This phase of the subject has recently attracted considerable interest, a clinician in Baltimore having reported a large series of cases. He read a paper before the Southern Medical Association at New Orleans two years ago in which he reported results that were rather startling to me.

In tuberculosis of the eye, in the glandular type, even in the pulmonary type if properly selected, if tuberculin is used in a sensible fashion with proper appreciation of dosage, time interval and increase of dosage, it is a therapeutic agent that has some real value in the management of a condition which requires all the things we can muster to secure changes for the benefit of the patient.

One of Switzerland's cantons has passed a new law for the sterilization of the mentally unfit, on condition that medical intervention first be recommended by a physician. This is considered to be the most drastic law of the kind ever adopted in Switzerland or even in Europe, and its passage was due mainly to the efforts of the Swiss women during recent years. Other cantons are said to be likely to follow the example. —Med. Journ and Record.

PERIPHERAL NERVE TUMORS*

By ROBT. P. BALL, M. D., Louisville.

There are three primary reasons why I make this report. First: It is a comparatively rare lesion, which is being reported more frequently in recent years. This in all probability is due to the better recognition and proper classification of the tumor. Second: In the study of the histogenesis of this tumor we have an excellent demonstration of the comparative clinical benignity of a differentiated, so-called adult form of the tumor, as compared with the malignant traits of an undifferentiated tumor. Third: The discussion of these tumors affords an opportunity to add to our knowledge a few of the differential points in the diagnosis of tumors in the neck.

The first use of the term neuroma to describe "deep seated tumors which are characterized by painful swellings of the nerve involved" was made by Odier in 1803. In 1845 Gunsberg made the first reference to the production of a tumor by hyperplasia of ganglion cells. He noted the presence of ten to fifteen times the usual number of ganglion cells present in a tumor removed from the site of the Gasserian ganglion. Virchow classified peripheral nerve tumors into true and false neuromata in 1863. These terms are oftentimes encountered today. He further divided the true neuromata into three types. (1) Neuroma ganglio-cellulare, a tumor composed of ganglion cells. (2) Neuroma fibrillare amyelinicum, a tumor composed of non-medullated fibers and (3) neuroma fibrillare myelinicum, composed of medullated nerve fibers. As the name so strongly suggests, the false neuroma referred to tumors located on nerve trunks, but presumably composed of structures not neurogenic in origin.

The most common peripheral nerve tumor is the neurofibromatosis described by von Recklinghausen. This tumor is found in all parts of the body and apparently originates from the perineural sheath. The next closest associated type of nerve tumor is the neurogenic sarcoma described by Ewing which is usually found in the deep fascial structures in the inter-muscular planes. The next in frequency reported is the paraganglioma and neurocytoma. These tumors arise from the carotid body and medulla of the adrenal gland respectively. It is a rarer type of tumor which I wish to report to you this evening, namely the nerve tumors arising from the prevertebral and peripheral ganglia. This latter type of tumor was first reported by Loretz in 1870 who stated he believed it arose from a pre-

vertebral ganglion. About fifty-four cases are now recorded. The majority of these were located in the abdominal segment. Only nineteen cases have been reported in the thoracic or cervical segments.

EMBRYOLOGY

A brief reference to the embryological development of the peripheral nervous system is necessary for us to appreciate the histological picture presented by this type of tumor. It will further enhance our understanding the relative clinical benignity of the fully differentiated tumor.

On either side of the neural plate there is an elevation called the neural crest. The cells forming the neural crest are large cells known as indeterminate cells. These cells migrate anteriorly and come to occupy a position anterolateral to the bodies of the vertebrae. From this location there will be a number which migrate further anteriorly and come to rest in the locations which we recognize as the site of peripheral ganglia. It is during this migration that there is a differentiation of the nerve cell from the indeterminate state. The indeterminate cell of the neural crest is referred to as the neurocyte. It is a round cell with deep staining nucleus differing very little in appearance from that of a lymphocyte. The next stage in the differentiation of this primary sympathetic ganglion cell now located anterior to the vertebral column does not alter the appearance of the cell to any great extent, but at this stage we refer to the cell as a sympathogonium. In the next stage there is a more appreciable change in the character of the cell. The cells which are destined to be the chromaffin system and ultimately occupy positions in the carotid body or medulla of the adrenal are then termed phaeochromatoblasts, while those cells destined to be the sympathetic ganglia are termed sympathoblasts. Even at this stage there is the smallest degree of difference in their appearance. The sympathoblasts probably show a slightly more fibrillar differentiation and increase of cytoplasm. The chemical characteristic of the cells show a greater change as noted by the affinity of the phaeochromatoblasts for chrome salts. The adult cell of the respective types is the final stage in their development.

With this information we can appreciate how difficult it was to correctly classify these tumors as neurogenic in origin when the tumor cell presented such a close resemblance to a lymphosarcoma or fibrosarcoma. The enlightenment came from two sources. First, because of the location in the neurogenic tissue and second, which is the most conclusive, because both immature and mature cells are found in the same tumor.

*Read before the Jefferson County Medical Society, March 18th, 1929.

DIAGNOSIS

The clinical manifestations of this lesion are extremely varied and rarely diagnosed previous to operation. In the nineteen reported cases a correct diagnosis was made previous to operation in two instances only. There are sufficient diagnostic criteria presented by these tumors to warrant a correct pre-operative diagnosis in almost every case. After the enumeration of individual factors concerned in the diagnosis we shall summarize.

Age: The youngest of the series was 13 weeks and the oldest 73 years. The mean age was 25 years. Seven cases occurred in the first decade of life and only one in the second decade, with none in the third. However, in the fourth decade five cases were found, two in the fifth, one in the sixth and one in the eighth. The ages of two were unknown.

Sex: Nine were males and 8 females. Two were unknown. It is about equally divided as to sex.

Location: Only two cases were located in a peripheral position. All the others were attached to the pre-vertebral sympathetic ganglia. They were about equally divided between the right and left side of the body. Those attached to the pre-vertebral ganglia were posterior to the large blood vessels.

The signs and symptoms presented by these tumors would necessarily be somewhat manifold. Yet they are characteristic enough to suggest their origin. The principal objective signs are tumor mass, distended, superficial veins, dyspnoea, elevation of the thoracic cage, and sympatheticopathy. The latter may be manifested in the manner of Horner's syndrome, but usually all the derangements are not present at the same time. A brassy cough or altered voice may be present. The subjective signs are pain, suffocation and a sense of pressure.

With these varied signs and symptoms common to other tumors located in this region of the body it is essential that we consider the accessory aids in differential diagnosis. The most important of this group would be a roentgenogram. Either stereoscopic films or an antero-posterior and lateral film will definitely locate the tumor. It further shows the relationship of the trachea and esophagus to the mass. The basal metabolic rate will aid in ruling out a sub-sternal or intra-thoracic goitre.

There are two other findings worthy of mention in the diagnosis of this lesion. The duration of symptoms is usually two years or longer. In one case it was twenty years. Lastly, the physical findings which are so dependent upon the organs involved; we must use them as corroborative evidence. To illustrate: A tumor mass encroaching upon the apex of the pleural cavity will produce find-

ings at great variance with an equally large tumor mass located somewhat higher or more posterior in the mediastinum. But of the peripheral tumors there is a fairly constant physical finding. On palpation and manipulation the tumor will be relatively fixed in the long axis of the body as contrasted with a free lateral motion.

PATHOLOGY

The microscopical appearance is fairly characteristic of this particular tumor. It is discrete, usually encapsulated and has numerous nerve fibers attached to it. In situ the fixed portion is traceable to a nerve ganglion or plexus. The shape is roughly rounded or ovoid, being somewhat dependent upon the location. The consistency is only moderately firm, except in the neuro-fibromata, which are stony hard. The cut surface shows a variation in color between the periphery and center. The differentiated areas are a pale yellowish gray as compared to the pale gray, undifferentiated portions. Areas of necrosis and hemorrhage are rarely present due to the slow growth.

The microscopical appearance will vary with the stage of differentiation and area from which the section was obtained.

In the sympathicoblastoma we find a cellular tumor composed of elongated, ovoid shaped cells, lying in a loose fibrillar stroma which is not very abundant. The tumor cells contain a moderate amount of faintly staining homogeneous cytoplasm. The nuclei are rounded and rather deep staining. Nucleoli are not distinct. Mitotic figures are not frequently seen. The resemblance to a fibrosarcoma is very striking. Replacement of adjacent tissue is seen and sometimes there is metastasis to regional lymph nodes.

The ganglioneuroma consists of apolar, unipolar or bipolar ganglion cells lying in an abundant loose fibrillar stroma containing medullated or nonmedullated nerve fibers. The ganglion cell may be polyhedral shaped, but more often ovoid form. These ganglion cells have abundant, faintly staining, clear cytoplasm and round, deep staining, nucleus. The polar cells show a cytoplasmic prolongation. The nerve fibers are occasionally found to be continuous with the ganglion cell, but due to their large number it is doubtful if all are connected to a nerve cell. Mitoses are rarely found in this tumor.

The neurofibroma consists of bundles of collagen fibrils lying in a compact formation showing only an occasional nucleus. These nuclei are flattened and compressed in appearance. Non-medullated or medullated nerve fibrils are not often found which gives support to the argument that this tumor is not primarily neurogenic in origin. But frequently there are found oval or rounded

bodies which are thought by some to be the remnant of a ganglion cell.

PATHOGENESIS

With the above information it is now possible to appreciate the clinical characteristics of these tumors relative to their degree of malignancy. The sympathicoblastoma will invade adjacent tissue and metastasize to regional lymph glands. The rate of growth is very slow and it remains localized for a long time. The tendency to differentiate into the adult cell is shown by the frequent combination of differentiated and undifferentiated cells in the same tumor. This characteristic is well illustrated in a case reported by Cushing & Wolbach. The infant son of a physician developed a tumor mass over the dorsal spine. Symptoms of spinal pressure were present. A biopsy was taken and a diagnosis of fibrosarcoma was made by Doctor James Ewing. The patient was given Coley's fluid without diminution in the size of the tumor or improvement of the neurological manifestations. However, there was no extension of tumor and several years later Doctor Cushing operated upon the patient. He found at operation a lobulated, encapsulated, extra-dural tumor, extending out between the pedicles. The spinal root ganglion was involved in the tumor mass and thought to be the origin of the tumor. Sections of the tumor at this time showed a ganglioneuroma. These later sections were seen by Doctor Ewing and he concurred in the diagnosis. The neurofibroma and ganglioneuroma are considered to be benign in that they do not metastasize and grow very slowly. There is one characteristic of the growth which is very important in considering the treatment. These tumors tend to encircle adjacent blood vessels or tubular organs. This will produce some constriction and pressure, but in the reported cases it has not closed the lumen of the vessels.

TREATMENT

The treatment is obviously an early excision of the tumor. It is resistant to radiation therapy and tends to progressively enlarge. By early excision there will be less chance of metastasis if it is a sympathicoblastoma and if a ganglio-neuroma or neurofibroma the removal is much easier accomplished before large blood vessels are encircled. The pressure atrophy of adjacent structures and discomfort of the patient are other urgent needs for early excision. To better illustrate this type of lesion I wish to present three cases which came under my observation while on the surgical service at the Cleveland Clinic. These cases are reported in detail in *Surgery, Gynecology & Obstetrics*, April, 1929 with a complete review of the literature. At this time I wish to express my gratitude to Doctor G. W. Crile for the privilege of using

these cases for this paper. Each case is an example of each type of tumor which we have discussed.

Case I: A white male, 51 years of age, came to the Cleveland Clinic March 9th, 1927. He had a tumor in the anterior triangle of the right side of the neck which had been present for 20 years. For the past three years he suffered shortness of breath, sensation of pressure in the chest and general weakness.

He was a well developed, muscular man, six feet in height and weighing 195 pounds. The eyes were normal. There were distended, superficial veins over the lower abdomen and lower extremities. The chest was symmetrical and expansion was equal on both sides. The tumor in the neck measured about 10 cm. in diameter and was somewhat rigid. The overlying skin was freely movable. There was a broad area of dullness to percussion in the mediastinum and right apex of the lung which blended with that of the tumor. The urine and blood were normal. A radiographic examination showed a large, dense shadow extending from the level of the sixth cervical vertebra to below the level of the second rib anteriorly and encroaching upon the apex of the right lung. The trachea deviated to the left. On March 12th the tumor was exposed by the usual, low collar, thyroid incision. It was found to be very firm, lobulated, encapsulated and continued down into the mediastinum. A nodular area was excised for microscopical examination. The tumor cut with considerable resistance and was relatively avascular. The microscopical diagnosis was neurofibroma.

The patient was informed that any attempt to remove the tumor would be fraught with considerable risk. He went home and returned about two months later. In the interval he had grown weaker and was suffering more intensely from dyspnoea and increasing sensation of pressure. Although the operative risk was made clear to the patient he insisted on an operation being performed. The tumor was removed on May 9th, 1927. It was found to extend into the superior, posterior and middle mediastinum. It was necessary to resect the manubrium sterni to remove the tumor. It had encircled the right subclavian artery and vein. The encircled portion was ligated on either side and removed along with the tumor. The pleura was firmly adherent to the tumor at the right apex and the pleural cavity was opened in removing it. The pleura was repaired and the resulting cavity following the removal of the tumor was packed with gauze. The day following operation there was a partial paralysis of the right forearm and hand. The radial pulse on the right side was obtainable, but the color of the hand was good and it was fairly warm. He died on the

third post-operative day.

The tumor weighed 550 gms. It measured 15x11x8 cm. It was nodular and somewhat lobulated in appearance. It was covered with numerous fibrous-like cords and was of a stony consistency. The cut surface was dull white, lustreless and striated. The microscopical sections showed large bundles of collagen and elastic fibrils, compactly arranged with small, flattened and narrow nuclei, lying between the fibrils.

A necropsy showed an acute mediastinitis; acute pleuritis, right; collapse of the right lung and displacement of the mediastinum to the left. The pre-vertebral ganglia on the right side from the sixth cervical to the fourth thoracic vertebrae were not found.

Case II: A white girl eight years of age came to the Cleveland Clinic with a history of a brassy cough and audible breathing for the past three years. One year previous to these symptoms she had scarlet fever and at 10 months of age she had whooping cough. She was suffering from intermittent periods of difficulty in breathing, headache and vomiting. There was a loss of appetite. She had had radiation therapy for the past 8 months.

The patient was fairly well developed and fairly well nourished, who measured four feet four inches in height and weighed 62 pounds. She had a normal temperature and 105 systolic blood pressure with 55 diastolic. The superficial veins of the upper portion of the chest and at the base of the neck were dilated. The respiratory excursion was normal. The apex of the heart was in normal position. An area of dullness was found in the superior mediastinum which extended to the lateral borders of the sternum and blended with the area of heart dullness. The breath sounds were tubular. Blood and urine were normal. A radiographic examination revealed a dense shadow extending from above the sternum to below the level of the second rib anteriorly and beyond the lateral borders of the sternum. The trachea and esophagus were displaced to the right.

The tumor was examined through a low collar incision and found posterior to the carotid sheath. It was encapsulated, fairly soft and the exposed surface was smooth. A biopsy was taken which showed apolar, unipolar and bipolar, well differentiated, large ganglion cells lying in an abundant loose fibrillar stroma containing medullated and non-medullated nerve fibers. A diagnosis of ganglioneuroma was made. The removal of the tumor was not attempted.

Case III: A white female, 40 years of age, came to the Cleveland Clinic on August 30th, 1927, complaining of a lump in her neck. This had been present four years. It appeared soon after the delivery of her youngest

child. There was no discomfort associated with the tumor. She had an occasional neuralgic type of pain to radiate down the inner side of the right arm and hand. Her past history was free from any serious illness or operations. She had had a tonsillectomy in 1925. There was no loss of weight, shortness of breath, tremor or weakness.

She was well developed and well nourished, measuring 5 feet 4 inches in height and weighing 170 pounds. Her pulse rate was 72. Systolic blood pressure 100 and diastolic 68. Blood and urine were normal. The tumor in the right side of the neck appeared to be about the size of a lemon. It projected slightly above and extended to about the mid-portion of the clavicle. It was firm, freely movable in lateral directions, but, on attempting an upward or downward displacement there was limitation and the patient would complain of pain radiating down the inner side of the arm. Doctor Crile told the patient he thought she had a nerve tumor and suggested it be excised.

October 17th the tumor was exposed through an incision parallel with the right clavicle. It was found to be somewhat pyramidal shaped with the apex pointing outward. It was covered with a plexus of nerve fibers and attached to the medium cord of the brachial plexus. The base was rather firmly attached to the fascia lying in front of the body of the sixth cervical vertebra. The carotid artery was superficial to the tumor. It was removed intact and the patient had an uneventful recovery.

The tumor mass was roughly ovoid in form measuring 70x40 mm. and moderately firm. The capsule was covered with a plexus of nerve fibers. The cut surface showed a pale yellowish gray cortical zone of uneven thickness and a pale grayish white central portion. Microscopical sections showed two different types of structure present. The cortical area was made up of apolar ganglion cells lying in a loose fibrillar stroma which contained non-medullated nerve fibers. The central portion was made up of a cellular structure with scanty stroma. The cells were elongated with fairly abundant cytoplasm and deep staining nucleus. The limiting membrane of the cell was rather broad. Pathological diagnosis was sympathicoblastoma and ganglioneuroma.

SUMMARY

Nerve tumors arising from pre-vertebral and sympathetic ganglia are rarely encountered. When they do occur in the form of a sympathicoblastoma they are likely to be mistaken for a fibro-sarcoma.

In the differential diagnosis of tumors of the neck and mediastinum it behooves one to hold in mind the possibility of this type of tumor.

The accumulated data on 19 reported cases suggests the following in the differential diagnosis:

A tumor located in the region of a ganglion which is fixed in the long axis of the body and produces a neuralgic type of pain. Its rate of growth is slow and usually of several years duration. It is found covered with nerve fibers, encapsulated and tends to encircle adjacent tubular structures. There are no constitutional symptoms attributed to the products of the tumor growth. The location and origin suggests due consideration of this tumor in cases of sympathicopathy. In early diagnosis and excision the prognosis is good.

DISCUSSION

A. James Miller: Primary nerve tumors may arise in any part of the body where primitive cells normally exist. They are most frequently found along either side of the vertebral column. If I am not mistaken a few such tumors have originated in glands of the intestine. In addition to these locations primary nerve tumors have arisen in tissue which had lost much of its characteristics of nerve tissue, developing from cells that were once closely associated with the nerve tissue anlage. Nerve tumors have also been found in such glands as the adrenal, the carotid body and certain other glands of internal secretion.

There is also abundant evidence to show that such tumors have arisen in locations where normally no primitive nerve cells exist. The presence of such tumors is explained by the fact that early in embryonic life some of the nerve tissue that has begun to differentiate has gone astray and found a new location for itself. That would explain the appearance of some of these tumors in the kidneys, liver, etc. During early embryonic life some of the nerve cells migrated into abnormal situations and later there developed into neoplastic growths.

The diagnosis of these tumors is rather interesting, because it is so similar, I think, to the diagnosis of neoplastic disease elsewhere in the body. In practically all neoplasms the cardinal sign is a tumor mass. When a tumor mass is found in any part of the body, our first thought should be of neoplastic disease.

Perhaps the most important point in differential diagnosis is determination of the exact location of the neoplasm. When a tumor is found that might have its origin in the normal peripheral structures, the type of growth described by Dr. Ball must always be considered. This is true regardless of the location of the neoplasm.

Other symptoms in neoplastic disease depend upon the size and location of the growth, such as pain due to pressure, a dragging sensation, compression from presence of the neoplasm etc. The list of neoplastic diseases which can be recognized because of some specific change in

the internal secretions is comparatively small. The type of tumor described by Dr. Ball is usually of long duration in contradistinction to certain other neoplasms which develop rapidly. Nerve tumors tend to grow very slowly.

The last report I have seen in the literature of this subject related to a tumor involving the pituitary gland which interfered with its internal secretion and resulted in death from hypopituitarism. In such cases probably death occurs from toxic substances rather than from the neoplastic growth.

I am very glad to have heard Dr. Ball's interesting paper.

W. O. Johnson: Dr. Ball is to be congratulated for presenting this group of very interesting tumors.

Prior to January, 1929, there have been recorded in the literature 1857 cases of malignancy of the thyroid, with an accurate clinical diagnosis made in only 30 per cent of the cases. So the clinical diagnosis of two primary nerve tumors out of 19 reported cases is a very good average.

As the essayist stated there are no characteristic symptoms of primary nerve tumors of the neck. So one would expect that the mediastinal nerve tumors are most frequently mistaken for malignancy or intrathoracic goitre, a differentiation not easily made.

The three most difficult tumors of mediastinum or substernal areas to differentiate are, malignancy, intrathoracic goitre, and nerve tumors.

In cases of malignancy the history is usually very characteristic, a small nodule (adenoma) in neck for 15 to 20 years, and about 40 years of age the tumor begins to increase in size, associated with choking sensation, tracheal pressure, frequency of swallowing or coughing, and loss of voice. In such cases this is indication of laryngeal nerve involvement, which is practically only present in cases of malignancy or extreme cases of chronic thyroiditis. Hoarseness and voice loss are very significant symptoms of malignancy of thyroid in association with the above picture.

In intrathoracic goitre, which is more common among men because of heavy ribbed muscles, nearly always there is an adenomatous goitre present and often a history of sudden disappearance in size of the goitre. X-ray examination is of great value in demonstrating the intrathoracic or substernal mass, together with the tracheal deflection. But in practically none of these cases is there a loss of voice or evidence of recurrent laryngeal nerve involvement, rapid growth, or fixation of the tumor.

In cases of primary nerve tumors of mediastinum or subclavicular region the history is usually that of lateral tumor in neck with very slow growth, in persons usually in the thirties, without any recurrent laryngeal involvement and with lateral motion of growth but fixation of growth horizontally. Encapsulated mass and

the x-rays are of great aid in differentiation of these tumors. Usually higher in neck than malignancy or intrathoracic goitres.

Of course Hodgkins disease, lymphosarcoma, and primary malignancies of lungs and mediastinum must be excluded.

This very inclusive presentation of these sub-sternal growths, if borne in mind, will aid greatly in an earlier recognition and diagnosis of such tumors in the future, and when a favorable prognosis can be rendered in such cases it will be very gratifying to the patient.

I am deeply indebted to Dr. Bail for this instructive and masterful presentation of these cases.

Robert P. Ball, (in closing): I wish to thank the gentlemen for their discussion. In the paper I called attention to the fact that an accurate clinical diagnosis of mediastinal nerve tumor may be possible. The roentgen-ray is often helpful but does not constitute a definite means of differentiation. These patients do not, as a rule, apply for treatment until late symptoms have developed. This may be many years after a nodule in the neck was first noticed. In one of the cases reported the tumor had been present for twenty years. Without a biopsy a differential diagnosis between a benign and malignant neoplasm of neurogenic origin is not likely to be made.

Early surgical excision is indicated in every case of nerve tumor involving the neck and mediastinum because after the tubular structures have become involved it may be impossible to remove the neoplasm.

Chronic Otorrhea Treated with Calot's Solution—The composition of Calot's mixture is as follows: guaiacol, 11 creosote, 5 sulphuric ether, 30, iodoform, 10, and olive oil, 70. The ear should be cleaned of all secretions that may be present in it at the time. After the bottle has been carefully shaken, from 5 to 10 drops of the solution is instilled into the canal of the affected ear, the head being bent to one side so that the treated ear is uppermost. In order to get the disinfecting fluid into the eustachian tube, Harnick employs tragus massage. In this method the opening of the external canal is closed by pressing the tragus against the canal wall and bringing alternate pressure to bear on it so as to effect a pumping action on the mixture. This massage is kept up till the patient feels the medicament in the throat. This procedure is carried out every night for a week. Nothing else is done. By this time the secretion will have changed from a thick,ropy to a thin, serous nature. When it is also markedly reduced in amount, the instillations of Calot's solution are discontinued, and insufflations of boric acid powder are used. After several of the latter procedures, the ear will appear dry.

LOBECTOMY FOR LEFT OCCIPITAL LOBE TUMOR*

By R. GLEN SPURLING, M. D., Louisville.

I am showing this case to you because it presents some rather unusual features. The patient is a female, age 22 years, who was admitted to the medical service of the Louisville City Hospital about a month ago with a provisional diagnosis of "meningitis" or "encephalitis." The family and past histories are essentially negative. She has been in excellent health up until the beginning of the present trouble.

In April, 1929, she began to suffer from severe headaches and pain in the back of the neck. The headaches were located chiefly over the occipital region and were severe enough to incapacitate her. When the headaches were most severe, she noticed stiffness and pain in the entire cervical region of the spine. Shortly after the onset of these symptoms, she began to vomit. The vomiting was not preceded by nausea. She has noticed for several months that the vision to the right side is not so acute as to the left side. During the past three or four weeks, the whole visual field has become blurring until now she has difficulty in seeing small objects.

On admission to the hospital, the following positive findings were noted: (1) There was an almost complete right homonymous hemianopsia; (2) Bilateral choked discs 5 D in each eye. Examination of the cranial nerves other than those mentioned above were negative. Examination of the cerebrum, cerebellum, spinal cord and peripheral nervous system was entirely negative. Spinal puncture showed a pressure of 410 millimeters. Laboratory findings, including blood and spinal fluid Wassermanns were negative. X-ray examination of the head showed convolutional markings and irregularity of the inner table of the skull in the left frontal region. A clinical diagnosis of occipital lobe tumor was made, but in view of the contradictory x-ray findings, a ventriculogram was decided upon. The ventricular needle was inserted into the left occipital region. At a depth of 1 cm. below the cortex, a cyst containing yellow fluid was encountered. This fluid clotted on standing. No air was injected.

Inasmuch as the fluid encountered was found to be due to a cyst in the occipital lobe, a pre-operative diagnosis of astrocytoma was made. We know from the work done by Bailey and Cushing on calcification of the gliomas that the astrocytomas are likely to be benign tumors. In fact, it is the common experience of all those dealing with brain tumors that the solid portion of the tumor is

*Case report and exhibition of patient before the Jefferson County Medical Society, June 17, 1929.

found in the cyst wall and can easily be removed. The prognosis in such cases is very good.

Three weeks ago, a left occipital bone flap was turned down. The brain was found to be tense and bulging. The dura was opened and a solid growth found below the cortex of the occipital lobe. An incision was made through the cortex to a depth of about three cm., and a solid grayish tumor was encountered apparently arising from the ventricle. Masses of tumor tissue had everywhere invaded the substance of the occipital lobe. It was felt that total enucleation of the tumor was impossible, so it was decided to excise the entire lobe. The cortical vessels were ligated with silver clips just behind the post-central gyrus, care being taken to avoid the middle cerebral artery. After the vessels were ligated, the lobe was excised with very little bleeding. The tumor had extended forward in the ventricle into the parietal lobe, and this was thoroughly enucleated after the lobe had been excised. After the bleeding was carefully controlled, the wound was closed in layers. The dead space in the occipital region was drained for twenty-four hours. Patient has made an uneventful post-operative convalescence.

For the first few days following the operation, there was a right hemiparesis and marked aphasia. These symptoms have slowly cleared up, and at the present time, three weeks after the operation, she is able to speak with some hesitation, and the right arm and leg are practically normal. So far as her mental status is concerned, she is alert and in full command of her mental faculties. Her vision has improved. Of course, the right homonymous hemianopsia is permanent since the occipital lobe has been totally removed. However, if we had been able to enucleate the tumor without sacrificing the lobe, she would have continued undoubtedly to have her homonymous hemianopsia, inasmuch as the visual pathways would of necessity have been destroyed during the removal of the growth.

I have asked Dr. Ball to discuss the macroscopic and microscopic characteristics of this tumor. While it is undoubtedly of a malignant type probably arising from the choroid plexus, I feel, that since we have done a radical removal, her chances of survival are good.

DISCUSSION

Robert P. Ball: The specimen consisted of entire left occipital lobe of the brain, it was somewhat macerated of necessity, and of course it was impossible for us to outline the tumor definitely nor to positively identify the choroid plexus in the specimen. As Dr. Spurling has said, the tumor was discrete but not encapsulated and there were many prolongations extending into the brain substance. It was pale gray in

color and of sponge-like character with some cystic formation. The cysts were very small, not a true cystic degeneration of the tumor.

When microscopic sections were examined we found the tumor mass composed of cuboidal and columnar type of cells lying in a rather abundant more or less homogenous stroma. We classified this tumor as being a carcinoma or at least of epithelial origin with stroma characteristic of carcinoma.

When we begin to interpret the type of a tumor that we are trying to classify and which was removed from the brain, we are limited to the stroma of the brain substance, the gliomatous tissue, or to the nerve cells in the brain, and of course the covering of the brain, with the additional factor of the nature or character of the tumor. In going over the history a metastatic tumor or extension from some structure that would give rise to a picture of carcinoma was not to be considered. This tumor was soft in type and arose within the brain. When we stop to consider the epithelial cells, parts of this tumor did perhaps have the typical character of the cells covering the choroid plexus. The ependyma is characterized by an elongated shape with a tapering end. Most of them in their normal situation, always in the embryo, are ciliated. In the adult they are not always ciliated, and they have this characteristic, that is common to neoplastic cells every where in the body, they may change their normal state and assume most bizarre forms. We do not therefore necessarily find this cell ciliated. There were no ciliated epithelial cells found in the specimen. However, we found layers of cells, 30, 40 or 50 cells, in apposition suggesting epithelial covering. The type of cell which covers the choroid plexus is a broad columnar cell which does not taper at the end, and in studying these sections carefully we did not find any cells that were tapering to suggest the possibility of any cells differentiating into ependymal cells. The lining of the lateral ventricle is of true ependymal cells at every point except that immediately covering the choroid plexus, there the cell changes to the type I have just mentioned. So we cannot positively say that this tumor did not arise from the lining of the lateral ventricle. The choroid plexus was not identified at the operation when the ventricle was exposed.

We classify this as probably a tumor arising from the choroid plexus from the type of cell—a carcinoma of the choroid plexus.

Dr. Spurling mentioned a recent book on neurological surgery edited by Dr. Bailey of Cushing's clinic in which appears a new classification of various tumors arising from connective tissue stroma. A few years ago authorities were content with the diagnosis of gliosarcoma if the tumor arose in connective tissue. It was the idea of Cushing, Bailey and others in the clinic that by carefully recording the different types of

gliosarcomata it might be possible to further classify them from the standpoint of prognosis. The prognosis in the majority of cases relates to the number of years the patient may live. This work is new, it is being checked throughout the country in a careful way. Dr. Bailey states in his book that it is quite possible the entire classification will have to be disregarded or revised. It is somewhat similar to the classification of Broders of the Mayo clinic covering malignant neoplasms in other parts of the body in that it is based upon the completeness of differentiation of the cells. This classification I think helps us in certain tumors, especially those involving the breast and skin. It is purely a question then whether or not the neoplasm is a slow or rapidly growing tumor, whether the cells are fully differentiated or embryonic in type, whether it belongs to type one, two, three or four. This may be of some value in determining the prognosis, but there are so many other factors that enter into the whole picture of tumor that this type classification must not be taken too seriously without due consideration of all circumstances. We know that a slow growing adenocarcinoma of the breast that has metastasized to the lung because of its long duration, has a much more grave prognosis than a rapidly growing malignant tumor of the breast that has not metastasized to the lung and is treated by radical excision. We hope in the future to be able to classify brain tumors in a manner that will offer some aid in prognosis.

This is certainly an unusual tumor, the only one of the kind I have ever seen. The prognosis in this case I think is excellent from the standpoint of brain tumor and I hope removal was complete, but from the type of cell present, the microscopic picture and characteristic appearance, I would hesitate about saying that the patient was completely cured. If the excision, which was wide, and radical, has included all the neoplasm and no metastases are present it will be a cure.

Wm. E. Gardner: The case reported by Dr. Spurling is most interesting to me from a clinical standpoint, and I have also enjoyed Dr. Ball's description of the pathology which was encountered.

The fact that there was homonymous hemianopsia with advanced choking of the optic discs indicated that a tumor was present and its position was probably in the occipital lobe. The only other probable location was in the temporal lobe, but the fact that there was no aphasia previous to the operation was against a lesion in this area, because if we have a subcortical lesion there involving the optic radiations, in addition to homonymous hemianopsia we usually have aphasia inasmuch as some of the speech centers are in this region. We have seen a number of cases of aphasia with homonymous hemianopsia

due to lesions, usually hemorrhage, in the subcortical structure of the temporal lobe.

It is significant in this case how well vision was preserved even with an advanced choking of the discs of five diptres as reported by Dr. Spurling. This is a very high degree of choking and more than we usually see in most cases of brain tumor, except in cases of long standing. In spite of this fact vision was still sufficiently well preserved that Dr. Spurling was able to make a measurement of the visual fields as shown by the charts which he presents. Many physicians believe that impaired vision comes early in optic neuritis, papillitis, papilledema, or so-called early choked discs, but it has been demonstrated by the eye men that vision may be fairly well preserved for several weeks, or even a few months, with moderate choking of the optic discs, and in some instances in which brain tumor was suspected but not proven, cases of fairly advanced optic neuritis have cleared up after a toxic or infectious origin had been removed with no impairment of visual acuity or permanent damage to the optic nerve. This is an important point because it gives us more time to study brain tumor for actual localization, without having to rush into a decompression operation for the preservation of vision, as was formerly believed necessary, even in the absence of definite localization.

The result obtained in this case is most gratifying, and I congratulate Dr. Spurling upon the result. The pre-operative diagnosis was undoubtedly correct, as was confirmed by operation, and while there is some post-operative aphasia and a moderate weakness of the right arm still present, both these conditions will probably clear up in a comparatively short time, or as soon as the edema about the operative scar has subsided.

R. Glen Spurling, (in closing): The only further thing that I have to say is in regard to Dr. Gardner's observation about the loss of vision associated with choked discs. It has been my experience that in rapidly advanced papilledema, like that seen in posterior fossa lesions, the visual loss is very rapid. While in the slowly progressive type of papilledema, like that seen in supratentorial lesions, the loss of vision is in direct ratio to the rapidity with which the papilledema develops. For instance, I have seen a case of cerebellar tumor in which there was complete blindness within two weeks of the first symptom suggestive of choked discs. On the other hand, I have seen papilledema develop slowly over a period of months in which the visual acuity would remain essentially normal.

I think, therefore, until a localizing neurological diagnosis has been made, that all cases showing papilledema should be considered emergency cases in order to save the eyesight.

POST OPERATIVE CARE OF SURGICAL CASES OF THE ABDOMEN*

By H. GLENN BELL, M. D., Cincinnati General Hospital, Cincinnati, Ohio.

The post-operative care of an abdominal case starts with the pre-operative treatment. More and more care is being directed to the pre-operative care, and wisely so. Certainly any case that requires the abdomen to be opened should have at least the lower bowels cleansed by an enema. Gastric lavage also if indicated.

The post-operative care of an abdominal case is made easy or hard depending on the care that the operator uses. Tissues that are handled gently at the operating table will not ery out with as much pain as tissues that are handled roughly. The way in which wounds heal is in direct ratio to the treatment of the tissues. So one of our first post-operative cares is to get healing per primum. This may be obtained in the greater per cent of the wounds, if reasonable care is used at the operating table.

Post-operative abdominal cases are usually those cases that have had some operative procedure on the stomach, intestines, colon, appendix or the female generative organs. There are several general principles one should keep in mind in the care of the abdominal case. One is to keep the fluid intake up either by mouth, rectum, subcutaneously, or intravenously. Another is to keep the patient comfortable with morphine. Yet another is to keep down abdominal distension. How easy is the latter with a small water and glycerine enema given frequently. A patient is grateful to you if you relieve that terrible gaseous distension. Abdominal cases are usually more comfortable in a low Fowler's position. There are cases of acute gastric distension that really beg for the stomach tube because it gives them such relief. The acute gastric dilatation may be due to a duodenal obstruction caused by a drag of the superior mesenteric artery over the third portion of the duodenum. This condition can usually be relieved by turning the patient on his side or on his abdomen. If it persists, it becomes a post-operative complication that may require a second operation. That, however, is not within the scope of this paper.

The emptying of the bladder may assume great proportions in the patient's mind if the act is not accomplished within the first twelve hours. The usual procedures such as a hot water bottle over the bladder, the pouring of water over the external genitalia, or the giving of a hot enema should be tried before the patient is catheterized. In our clean appendi-

cal cases, hernias, or clean lapartomies we even allow our patients to sit up, or even stand up by the bed side to void rather than have them catheterized. One even dreads the possibility of a cystitis that may occur following a catheterization.

Many of the procedures that we use are old and are known by you all, but it may be of some interest to know just the definite procedures we use in certain specific cases. In a gastric resection or gastro-enterostomy we allow nothing by mouth for forty-eight to seventy-two hours. We keep the patient's fluid intake up and his thirst down by retention enemata of coffee and physiological salt solution, 150 c. c. each, given every four hours, a daily infusion of 2000 c. c. of 5% glucose in salt solution, and a daily intravenous injection of 750 c. c. of 5% glucose in salt solution. That makes a daily total of 4550 c. c. of fluids. After forty-eight to seventy-two hours, depending upon whether the case is one of a simple gastro-enterostomy or a gastric resection, we start the patient upon the gastro-enterostomy diet which is as follows:

1. Nothing by mouth for forty-eight hours (seventy-two in gastric resection).

Third day—water oz. 1 q. 1 h. Continue infusions.

Fourth day—water oz. 2 q. 1 h. Continue infusions.

Fifth day—water oz. 3, alternating hourly with broth, albumen, water or buttermilk.

Sixth day—water oz. 4, alternating hourly with broth, albumen, water or buttermilk.

Seventh day—water oz. 4, coddled egg night and morning.

Eighth day—ad lib, coddled egg night and morning.

From then on the patient is given a surgical soft diet four times a day. We have used the foregoing regime satisfactorily on a fairly large number of cases. So far we have not been bothered with post-operative vomiting, or the so-called vicious circle of vomiting. We also use the above treatment on the cases with an acute perforated gastric or duodenal ulcer.

In our gall bladder cases we have no specific treatment other than the usual care for any abdominal case. We practically always take the gall bladder out. The patient is given fluids freely by mouth, and at least one infusion of 1500 c. c. of salt solution. The patient is placed in Fowler's position and kept comfortable with morphine. A diet is given as soon as tolerated. Such patients are made to change their position often to help prevent pneumonia. Cases of common duct, drainage may require bile salt, some method should be used to try to get the bile to go into the intestine.

Cases of simple appendicitis are placed in Fowler's position when reacted, and given

*Read before the Campbell-Kenton County Medical Society, June 20th, 1929.

water ad lib. Soft diet is given when tolerated. Simple water and glycerine enemata for gaseous distension are also given. These cases are usually up on the sixth day and home on the seventh. This is the type of case we allow to sit up or stand up to void if necessary, rather than catheterize.

The post-operative care of acute appendicitis cases that have ruptured is more complicated because one must keep in mind the numerous complications that may arise such as intestinal obstruction, subphrenic abscess, pyelephlebitis, etc. These patients REQUIRE FLUIDS! I have stressed this point several times because it is important. Too often one goes through a surgical ward and observes a septic patient that is dehydrated and with the odor of acetone on his breath. The post-operative care of any abdominal case requires watching for complications which should be treated early. This is especially true with intestinal obstructions.

The care of a case of intestinal obstruction requires a large intake of salt to replace the depleted chlorides of the blood. We do this through the jejunostomy tube, by intravenous injection of salt solution and infusions. We have used the continuous intravenous injection of salt solution in cases of paralytic ileus with success.

In the care of gynecological cases we have about the same conditions to treat as in other abdominal conditions except that there is less chance of a severe post-operative reaction as follows a gastric resection. This is not true of course in the cases of panhysterectomies. Here the post-operative care is supportive and requires great care, for the mortality rate of panhysterectomies is far too high.

Cathartics are always open for discussion wherever there is a group of doctors. I am opposed to any strong cathartic. In all of our abdominal cases we use a mild laxative such as mineral oil or cascara, or milk of magnesia on the evening of the third day. We have had no reason to change from this procedure.

We transfuse an abdominal case on the operating table or immediately after the operation, if indicated. This is an excellent treatment following a splenectomy or in gun shot or stab wounds of the abdomen with a large loss of blood.

In conclusion I wish to say that the post-operative care of abdominal cases start with the pre-operative care and continue on through the operation. The patient must be kept comfortable. Fluids are the outstanding essentials. They must be given either by mouth, infusion, intravenously, or per rectum. Distension must be controlled by enemata or otherwise. One must watch for complications and treat as soon as they arise.

PALM ABSCESS*

By BURTON A. WASHBURN, M. D., Paducah.

In presenting this subject "Palm Abscess" certain points in the management of same must be considered, namely: The pathology and the possible deformity that may follow, the anatomy and function of parts involved in this infection. The best method of producing function and the percentage of disability that will follow. This article is written with the purpose of a constructive criticism and the photo exhibits will show that unless a palm abscess is seriously considered by the attending surgeon, a disastrous result as to function will follow, and a permanent deformity to the patient throughout his life; therefore, in the examination it is essential to review the function of the tendons that will be concerned in this treatment, the isolated pus pockets given early drainage and then the persistent, continuous treatment of moist heat and light rays to save the tendon sheath. A very cautious procedure in making drains should be considered because a fibrous thickening of the tendon sheaths and a matting will prevent a return of normal function. In presenting these photo exhibits, you will notice that one plate shows a sufficient number of knife scars that would have taken but little more to complete an amputation. The other exhibit you will notice the rough and wrinkled appearance of this hand due to moist packs and sun rays. You will also notice that in the palm surface of the index finger a drain was placed. The palm was then drained at the inter-spaces between the metacarpophalangeal joints of the first and second finger. I would further advise that at the time of the first examination of this case there was an infection with swelling equal to exhibit No. 2. In exhibit No. 1, a perfect result as to function followed and in No. 2 a 75 per cent disability developed.

Referring to photo exhibit No. 1 the infection involved the fascia of the palm and extended under the tendon attachment to the periosteum of the third phalanges. In this condition there was limited flexion of the hand because of pain and a slight swelling over the first metacarpal. This swelling increased over the palm (seemingly superficial) however the inflammation involved the deep palm tissues and extended to the pronator quadratus. This case presented a picture typical of exhibit No. 2. The decision to be made by the surgeon handling these palm cases is where to make drainage and the function that will follow after he has outlined a treatment which will meet the individual case. It is certain that promiscuous cutting

*Read before the McCracken County Medical Society.



and tube drainage always means a percentage of deformity. I call your attention again to exhibit No. 1, wherein pus was located along the deeper structure of the palm surface of the index finger, furnishing a drain for the pus in the deep structures of the palm. A drainage after severing the skin was made by a blunt instrument following the fascia of the tendons to the middle of the meta-carpal bone where the pus was located. There was no incision in the palm because a sufficient drain could be had as indicated. The persistent line of treatment used was the hot bichloride baths followed with a sun ray treatment for heat and light penetration. As a result this patient made a good recovery. On the other hand, exhibit No. 2 was given tube drainage with numerous incisions which the photograph verifies with the prognosis of amputation. This case was finally placed in the hot baths with the light treatment, amputation was prevented, but a 75 per cent disuse of the fingers followed as disability. The length of time that the hot baths should be used varies in individual cases, but unless you get an early response with your hot baths in a short period of treatment time you must then keep this infected palm in the water bath for several hours each day and this bath should continue until you have gotten the appearance which exhibit No. 1 presents. The contracted skin shows when the swelling or inflammation begins to subside, however this

bath should not be discontinued because of this appearance which exhibit No. 1 presents, but should continue until the patient shows some signs of flexion and extension, then you may gradually reduce the treatment time. I would further advise that in the examination of exhibit No. 2 there was no pus accumulation over any of the fields of incision. The pus pocket, which I believe to be the cause of this abscess, was located under the lumbricalis of the second and third meta-carpal bones and the probe which was introduced in this median line gave a marked discharge of pus between the bones following the tendon sheaths and I failed to get anything other than wound secretions caused by inflammation of the tissues from any of these incisions.

The first consideration to be given a palm abscess case when it presents itself for treatment is that the examination will reveal a condition which has been developing for some few days and it is an error for one to wait until the active pathological conditions are increased to such a volume that the functions of tissue is limited. It is not necessary to have a swollen palm to make a prognosis of traumatic or infectious palm abscess. The mere fact that a localized tenderness or pain is found in your first examination should be sufficient evidence for a radical investigation of the location of the cause that is producing these symptoms and in the percentage of



cases you will find a small field of pus or wound secretions which have accumulated by volume wherein a pressure is made that inhibits the function of the hand and likewise producing pain.

Undulant (Malta) Fever.—A method of concentration with specific serum was applied by Harold L. Amoss and Mary A. Poston, Baltimore, (Journal A. M. A., July 20, 1929), to isolate *Brucella* from the stools and parallel cultures by this method and by the usual planting on eosin-methylene blue (methylthionine chloride-U. S. P.) plates resulted in the recovery of the organisms from twenty daily consecutive specimens of stools by the former method and completely negative results by the latter. From the stools of a male patient with a history of onset of undulant fever sixteen months ago, a strain corresponding to *Brucella abortus* (porcine) has been isolated. These organisms are apparently identical with those obtained from the blood culture early in the course of his illness. It is suggested that, in cases from which the organism has not been recovered from the urine or the blood but in which the patient's serum agglutinates members of the *Brucella* group, either the patient's serum or the corresponding polyvalent or monovalent serum be used. On account of the dilution employed, the small amount of preservative may be disregarded.

PURPURA HEMORRHAGICA: SPLENECTOMY: RECOVERY*

By L. WALLACE FRANK, A. B., M. D., F. A. C. S., Louisville.

A male child, aged five years, was admitted to the Children's Free Hospital, August 18th, 1928. The history was negative for childhood diseases and previous infections, but the child had had some circulatory disturbance for about two months, with petechial spots appearing on the body without any apparent cause and with no history of injury. He had been under treatment and had been having nasal hemorrhages about every ten days. The hemorrhage would last for a day, then cease, and he was sent to the hospital for treatment of this condition.

Examination showed absolutely nothing except evidence of bleeding from the nose, with some softness and sponginess of the gums. His diet had been rather general, he ate everything he wanted, and there was no evidence of scurvy. Other than the fact that he had numerous petechial spots on the skin, particularly about the nose and mouth, the examination was negative, except for a moderate enlargement of the spleen.

Blood examination shortly after admission showed: hemoglobin 60 per cent, erythrocytes 1,200,000, leucocytes, 9,800; polymorphonuclears 75 per cent, lymphocytes 25 per cent. Clotting time of blood three minutes, bleeding time sixteen minutes. With the clotting and bleeding time as shown, the diagnosis of purpura hemorrhagica was rather evident.

The child was given 3 blood transfusions, one by Dr. Grigsby and two by Dr. Bruce. It so happened that I followed Dr. Grigsby on the service, and at that time the child was still relatively low, 2,000,000 red blood cells, hemoglobin percentage not stated. The third blood transfusion was given September 7th. Just before the transfusion the blood platelet count showed 37,000. September 8th the platelet count was 80,000.

Splenectomy was performed September 14, under ether anesthesia. The following is Dr. J. D. Allen's report on examination of the specimen. Spleen enlarged, smooth, 12x 7.5 x 3.5 c. m. The capsule is tense, but organ rather soft. Deep red, in color with pulp of soft bloody consistency. Malpighian bodies stand out conspicuously. Microscopically, the Malpighian bodies show hyperplasia of the germinal cells and lymphocytes. The venules are rather indistinctly outlined with distortion of the endothelial cells. The intervening reticulum of the pulp is abundantly loaded with red corpuscles, some of which

*Read before the Louisville Medico-Chirurgical Society.

appear to be disintegrating. The lymphoid cells are increased, also the large phagocytic cells, the latter showing debris of red corpuscles in their protoplasm. (J. D. Allen).

At the operation quite a few adhesions were found between the spleen and adjacent structures, and on that account a small cigarette drain was inserted. The boy had no untoward symptoms following the operation, but remained in the hospital several weeks, during which time frequent blood examinations were made. On October 29th, the blood platelet count was 210,000 or practically normal.

I saw the patient February 16th, 1929, when blood examination showed erythrocytes 4,500,000 with a hemoglobin percentage of over 80. He has had no further nosebleed nor hemorrhage anywhere else, and has made a nice recovery.

I am reporting this case because it seems of unusual interest, and it is rather uncommon to find a case of purpura hemorrhagica in a child five years of age. We have seen several others but they were all in older individuals.

DISCUSSION

Guy P. Grigsby: I do not recall the exact circumstances, but if the child described by Dr. Frank is one of those seen by me in the Children's Hospital in August, he was very ill at the time. I was asked to give a blood transfusion by Dr. Barbour, and after that the child began to improve. I went off the service September 1, and for that reason am not familiar with the later details of the case.

Dr. Frank is to be congratulated on his diagnosis, the successful handling of the case, and the result obtained. These cases are interesting, first from the standpoint of diagnosis, and second from the standpoint of treatment. I think it would be particularly interesting to follow this patient for a number of years and see just what will occur; the probability is he will remain well.

L. Wallace Frank, (in closing): There are two or three different types of purpura hemorrhagica. First, we have the type with enlarged spleen, second purpura with scurvy, and third the so-called rheumatic purpura, which is a disease distinct from the others.

In the type of purpura hemorrhagica under discussion until we began performing splenectomy the end-result in all of them was fatality. In this type of purpura hemorrhagica the blood platelet count is below normal. In this child it was 37,000, the normal is 250,000. The clotting time of the blood is practically normal, the bleeding time is prolonged. In this child the bleeding time was sixteen minutes, the normal time is about two minutes. The clotting time was three minutes, normal three to five minutes. It is on the basis of these data that we make the diagnosis of true purpura hemorrhagica. In all these cases the differential diagnosis is made

on the laboratory findings. The study of blood diseases has progressed markedly during the last few years.

I thank Dr. Grigsby for his suggestion. We had already outlined a program for this child. He reports to the Children's Hospital every three months for blood count and physical examination. He reports to our office every four or five weeks. He is apparently perfectly well.

We do not see many cases of this type of the disease. The fact that it can be absolutely cured by surgery is the greatest point of interest.

SQUINT*

By ADOLPH O. PFINGST, M. D., F. A. C. S.
Louisville.

Although the subject selected for our discussion may not be of general interest, as it relates to other departments of medicine, the condition of squint is so prevalent that a simplified consideration of this affection, especially as it pertains to its treatment, may be of interest. The subject suggested itself to me because I am convinced that many individuals with crossed eyes go through life with the affliction, who, with proper encouragement, would have the deformity corrected.

It has been my experience that individuals with a deviating eye are laboring under a heavy handicap. Most of them become sensitive and being cognizant of their deformity will not look you in the face in addressing you. In consequence their earning capacity will be diminished throughout life, to say nothing of the social embarrassment occasioned by the deformity.

When we speak of squint we are wont to apply it to the ordinary crossed eye as we frequently see it in early childhood, and at times in adult life, although the term squint is also applied to the turned eye resulting from a paralyzed muscle. In paralytic squint there is entire loss of motion in the field of action of the paralyzed muscle and a squint in the direction of its antagonist, whereas in the ordinary crossed eye, which is known as concomitant squint or concomitant strabismus, there is a normal range of motion of each eye, the amount of deviation showing no variation with the rotation of the eyes. While any of the muscles that have to do with the grosser movements of the eye may be involved, the vertical and oblique squints are very rare, hence I will confine myself to the cases involving the external or internal recti muscles—in other words, to convergent and divergent strabismus.

Speaking first of the convergent variety or the so-called crossed eye, we find that this nearly always develops very early in life,

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about the time the child is beginning to look at close objects, such as drawing and looking at pictures, books, etc. The great majority of these cases occur in hyperopes (far-sighted individuals) and can be explained in that a far-sighted eye is accomodating practically at all times—in other words, when looking at near or far objects. You will remember that associated with accomodation adduction of the eyes takes place, hence the more an eye accomodates the more it adducts. The adductor muscle hypertrophies and finally the abductor ceases to balance the eye and a manifest turn of the eye towards the nose results. This over-development does not occur as a unilateral condition as one would naturally suppose, but both internal recti are over-developed. It is usually the eye with the greater refractive error or the one with less perfect vision that finally crosses. Squints of this kind may be constant or they may be present only at times (periodic squint). As a rule when once the right or the left eye turns the same eye deviates constantly, however cases occur in which the squint alternates. Alternating squint often occurs soon after birth and may occur in eyes with normal vision and with low errors of refraction. They have been explained in a failure of the center that controls the ocular muscular balance the so-called fusion center—to develop.

Divergent strabismus, vulgarly referred to as "cocked eye" is also frequently the result of refractive errors. It occurs in the great majority of cases in myopes, in whom the act of accomodation is brought into play but very little, even when the eye is fixing close objects, as in reading, hence there is an under development of the adductor muscle and a tendency for the eye to diverge. This condition does not develop early as does the convergent squint as myopia usually develops slowly.

Quite a common cause for divergent squint is blindness in one eye. The amblyopic eye showing no tendency to fix finally turns outward irrespective of the nature of the refractive error.

Regarding the treatment of deviating eyes, it has been my experience that many lay people believe that a turned eye will finally correct itself, or as they put it, "the child will outgrow it." Presumably many physicians are of this same opinion for parents are not infrequently advised by their physician not to interfere with a case of squint as it will probably eventually straighten itself. While it is true that exceptionally the eyes become balanced without treatment after having been crossed for some time, in the great majority of instances the squint becomes worse with the growth of the child.

Treatment may be divided into the conservative and surgical. The first essential of

treatment is to study the refraction of the eyes under a cycloplegic agent, to determine the full errors and then to prescribe correcting lenses. Although I know that it is contrary to the accepted view, I do not give a full correction of the refractive error in convergent cases. I endeavour to give only enough correction to bring about parallelism, thus allowing the eyes to maintain some of their accomodation. In divergent cases even a full correction frequently fails to correct the deviation. The time to begin the use of glasses is as early as the child will keep them on. Theoretically, it would be perfectly sane treatment to put glasses on a babe at the breast; practically, this could not be carried out. I usually advise glasses at three years, but have prescribed them at two and one half years in manageable children. Parents naturally offer objections to putting glasses on their children, largely on account of a prejudice against glasses and the realization that when a child starts wearing glasses it will continue to do so throughout life. Many parents express the fear of accidents, the result of breaking of the glasses during play. Strange as it may seem accidents of this kind are extremely rare, whereas the presence of glasses has evidently protected the eyes of wearers from flying missiles, insects and dust.

Another conservative treatment of squint is to increase the work of the squinting eye by covering the good eye. While this method seems a reasonable one it does not seem to be of great benefit, at least my experience with the method has been disappointing. The same is true of another recognized method of treatment—that of keeping the good eye under the influence of atropine in order to force the defective one to work.

After we put glasses on a squinting child we may have to decide how soon surgical treatment is advisable in the event the conservative treatment fails to correct the deformity. There seems to be a diversity of opinion regarding this question. Some surgeons operate as early as the sixth or seventh year, whereas, the more conservative prefer to defer operative treatment until the child is older. It has always been my custom to await the time when I feel that I can get the co-operation of the child under a local anesthetic, which means anywhere between 10 and 15 years, depending upon the temperament of the child. I feel that there is the great advantage of operating under a local anesthetic, that the extent of the correction can be more accurately determined. In operating upon an individual under a general anesthetic this cannot be readily done and the outcome of the operation is less apt to be satisfactory.

The choice of operative procedure depends upon the nature and amount of deviation and

upon the operator. When I was training in ophthalmology practically all cases of squint in which surgery was employed were based on the principle of weakening the strong muscle by severing its tendon at the scleral attachment and allowing it to recede to a point farther from the cornea. While this procedure, the so-called tenotomy was in most instances successful in the immediate, it was often followed by deviation of the eye in the opposite direction, substituting a divergence for a convergence and vice versa. This method has now been largely supplanted by the more rational operation of strengthening the weak muscle rather than weaken the strong one. The motility of the weak muscle may be enhanced either by advancing it or by resecting it. Advancement is accomplished by severing the attachment of the tendon at the sclera and suturing it to the sclera at a point closer to the cornea, thus increasing the amount of rotation of the eye in the direction of this muscle. Resection is accomplished by cutting off a portion of the muscle at its attachment and reattaching it by suture to the point of its former insertion. Many methods have been devised for each procedure, the details of which I will omit. In low degree squints the operation is employed without treating the strong muscle, but in high degree squints it is combined with a tenotomy of the opposing muscle. The tenotomy has for its object a temporary inactivity to enable the advanced or resected muscle to attach itself and is by no means done in the endeavour to bring about a recession of its attachment. Personally, I seldom employ a tenotomy alone as it was formerly done, although I believe it still has a place in cases where convergence exists only when fixing close objects. I usually advance according to the method of Wiener, combining the operation with a tenotomy in high degree cases. In high degree cases it is my practice also to resect a portion of the muscle before advancing it. The lantern slides will demonstrate the method which I employ by choice. They will also give you illustration of various degrees of squint, before and after operation, and will point out the causes of failure in a small percentage of cases in which the operation did not bring about a perfect cosmetic result.

DISCUSSION

Samuel G. Dabney: I have greatly enjoyed Dr. Pfingst's paper. As regards the cause of squint, it must be remembered that a very small proportion of hypermetropes develop strabismus. This is especially true when both eyes have perfect or nearly perfect sight. The instinct for binocular vision is strong in such circumstances, though we occasionally even find a strabismus, sometimes of the alternating type. More commonly the squinting eye has defective vision.

This impairment is sometimes attributed to lack of use of the eye because of the squint; it is more probable, however, that the impairment precedes the squint and helps to produce it.

A word or two about modifying the effect of an operation by the use or non-use of glasses. Dr. Wolfe may recall assisting me in an operation for convergent strabismus in a twelve year old boy several years ago. We did an advancement of the muscle and secured a slight over-correction, there being a little divergent strabismus. It happens that this youth had a high degree of hypermetropia (4 D.). After the operation he was directed to wear his glasses for close work only for a year or two. This plan was carried out and the boy came to see me recently with an almost perfect result, a slight internal strabismus which would probably be corrected now by the constant use of glasses.

Claude T. Wolfe: This is an interesting subject and a very broad one. I am sure that Dr. Pfingst, if he had the time, could have spent several hours in his presentation.

Strabismus or squint for purposes of study may be divided into two groups: (1) Those due to known causes. (2) Those due to unknown causes. Paresis or paralysis of one or more of the extrinsic muscles, paralytic strabismus, belongs to the first group. Concomitant strabismus belongs to the second group, as does latent strabismus or heterophoria.

Since the essayist has elected to consider only concomitant strabismus, I shall not discuss the paralytic type. Concomitant strabismus is commonly associated with hypermetropia and is a condition in which the visual axes, though abnormally directed, retain their abnormal relation to each other in all movements of the eyes. Concomitant strabismus is responsible for much thought from the standpoint of etiology. Many points are not clear, such as the development of fixation, amblyopia exanopsia, etc. The theory that strabismus is due to a defect of the fusion center is the one quite generally accepted at the present time.

Having definitely decided that we are dealing with concomitant strabismus the character of treatment must be considered, whether operation or by other methods. A careful refraction, under a cycloplegic, is necessary. It is my practice to prescribe the full correction for constant wear. It goes without saying that a careful measurement of the angle of the squint should be done previously to the installation of the cycloplegic. Glasses are seldom ordered for a child under the age of two years. Further treatment depends upon the size of the angle of deviation, the vision in the squinting eye, etc. Orthoptic treatment has hardly been satisfactory in my hands.

Should operation be decided upon, the age of the patient should be considered, as a local anesthetic is far better than a general and chil-

dren under ten years seldom submit graciously to a local anesthetic. However, I have operated upon patients at the age of eight years.

My choice of operations is the one described by Dr. Pfingst and known as the Wiener operation. It was my privilege to be associated with Dr. Wiener during the late war, where many patients were operated upon. The operation is quite simple and the results very satisfactory. I have used it more than any other method.

Joseph J. Wynn: I have enjoyed Dr. Pfingst's talk very much. He has left little to be said, as he covered the subject so thoroughly. One important feature to be emphasized is that parents should be instructed not to wait too long before seeking medical aid for their children with squint. Quite frequently children six or seven years old are brought to the office and the mother states she has been advised by someone to wait until the child outgrows the squint. Of course we knew that seldom happens.

Another important reason for operating upon these patients early is the cosmetic effect, especially in young girls about puberty. They become very self-conscious about that time and squint has a depressing effect on them. If we can straighten the eye we will certainly have a most grateful patient.

Many of those doing the Wiener operation are entirely satisfied with the outcome, although there are other procedures which produce about as good results. I have done a great many resection operations, in which we resect a portion of the muscle and suture it to the stump of the original attachment. One advantage of this procedure is that you have a very good stump to which to attach the muscle. If a small portion of the muscle is left attached to the sclera, there is not much danger of the suture slipping. In cases of high degree squint, a tenotomy may be necessary, but this should not be done to correct small defects.

I have operated under general anesthesia on a child six years old for marked squint. I have operated upon quite a number of children of seven or eight years under local anesthesia, with very good co-operation.

Frank Pirkey: This is a very interesting subject to me, and I believe that it is of interest to almost everyone whether or not they specialize in eye work. We are now paying a great deal of attention to personal appearance and cosmetic operations of one kind or another are frequently performed. And there is no defect, which will attract more attention than one about the eyes.

Crossed eyes cause more than embarrassment to the average individual. A youngster is constantly jeered at by his companions, and a boy has to be a pretty good fighter to get along. As they grow older the defect becomes more important. Many a capable boy has been refused a job because he was cross-eyed, and in other ways this defect will often change the course of

the youngster's life.

I have seen a number of times the correction of this defect will change a person's entire mental attitude. It gives them a new confidence in themselves and usually the correction changes not only the appearance of the eyes, but the expression of the face and the whole bearing of the individual. I remember operating on a contractor. He said he would not care about the appearance of his eye, except that when he would be talking business to someone, they would keep looking at his eye instead of paying attention to what he said.

As to the choice of operation: There are three procedures which are most commonly employed, the advancement, the resection and the recession operations. There are also a number of others and many modifications of the three mentioned. I know of no operation in surgery which is performed in so many different ways. We are all prone to try the different operations and then adopt the one with which we feel that we can secure the best results. I think that if a man has good results from one operation, that is the procedure for him to use.

Just a word as to the handicap under which the ophthalmologist labors because he does not see patients with squint at the proper time. If we can get these patients at the proper time we can straighten many of their eyes with glasses. And the best time is as soon as the squint develops, so that we can determine just what the error is and prescribe glasses if needed. Personally I put glasses on children as young as I can. If they take a strong hyperopic correction there is no difficulty in getting them to wear the glasses at any age.

As to the time of operation, I believe that it is preferable to wait until they are old enough to use a local anaesthetic, as we can be so much more sure of the result. Some children can be operated upon as early as six years of age under local anesthesia while with others, it is necessary to wait until they are ten or twelve. I do not like to use a general anesthetic in squint operations.

I thank Dr. Pfingst for the privilege of hearing his paper.

C. Dwight Townes: I appreciate very much the privilege of being here this evening, and have enjoyed Dr. Pfingst's presentation and the discussion that has followed. In face of the extensive experience of Drs. Pfingst, Dabney, Wolfe and others, I cannot presume to offer anything of value from my own limited experience; but as Dr. Pirkey has said, the operation selected by the surgeon should be the procedure with which he is most familiar and by the employment of which he obtains the best results.

I had the privilege of working for two years with Dr. P. C. Pameson, of Brooklyn, N. Y., who devised what he is pleased to call the "Jameson recession operation" for the correction of squint.

This operation is used on the internal rectus muscle for convergent squint and upon the external rectus for divergent squint. It seems to me to be a very logical procedure for the correction of squint. In practically every case of convergent squint the internal rectus will be found thick and strong, whereas the external rectus will be attenuated and weak. In divergent squint the condition is just opposite.

The Jameson operation consists in separating the internal rectus from its attachment and moving the attachment backward so far as needed to correct the error, then reattaching it to the sclera by means of sutures. This obviates the possibility of any accident happening, such as used to happen with the old method of doing tenotomy, the tenotomized muscle being torn loose so that the border reattached itself anywhere it happened to. With the recession operation we have complete control of the muscle at all times and can reattach it to the sclera at the exact point where we want it. This method is accurate, and it has been found by repeated operations that we can measure exactly the amount of correction we will obtain, by measuring accurately the distance the muscle is retracted. It has been found that retracting the muscle one millimeter will correct five degrees of squint. Consequently retracting the muscle attachment five millimeters will correct squint of twenty-five degrees. That is the maximum we can correct with one operation. If the squint is thirty-five or forty degrees, which we often see, we can correct it by operating on both recti muscles, dividing the correction equally between the two. I have found this operation most useful in my limited experience, and my results have been satisfactory. There is no question of doubt, however, that the Wiener operation, which I have never used, affords just as good results in the hands of those who employ it.

In the American Journal of Ophthalmology recently there appeared an excellent article by Dr. V. Arms, in regard to the etiology of squint. He has shown by some brilliant research work that there is a definite relationship between scotoma and squint. He has examined one hundred carefully selected cases, and has shown that there is a very definite relationship between scotoma and squint. In all these cases there was a central scotoma of one eye.

Adolph O. Pfingst, (in closing: I wish to thank the gentlemen for their discussion. In closing I shall only refer to two or three points.

I hope I did not create the impression that the operative procedure I usually employ is the only operation for squint. I use the method of Wiener by choice, and should have said it is not the operation above all others. The old procedure of cutting the muscle and allowing it to retract is unsatisfactory, as there is no way of judging how far back it will park. In one of the cases of divergent squint shown on the screen

the divergence was secondary to a tenotomy in which the muscle retracted excessively. When we searched for the muscle it was found far back and we had to dissect it out and then by passing a thread through the stump, it was reattached to the sclera and you will note the beautiful cosmetic result. Any method which contemplates dividing and reattaching the muscle cannot be satisfactorily performed with the patient under general anesthesia for we cannot gauge the amount of correction accurately without the cooperation of the patient. With a bad result we are confronted with the embarrassment of having to do supplementary work later.

There is one advantage in operating on these cases early, as I see it, and that is to do the work before someone else will get your patient and operate. Sometimes while we are waiting for the child to become old enough so the operation can be performed under local anesthesia, the parents become discouraged or impatient and take the child to someone else for an operation under general anesthesia, regardless of the risk of an imperfect result. The point was well illustrated in the two cases shown you, done under local anesthesia, in which after doing combined advancement and tenotomy it was noted upon allowing the patients to fix an object that the eye which formerly turned in was diverging.

The tenotomized tendon was reattached to the sclera by suture and the eyes made parallel. These cases under a general anesthetic would have been failures.

While I have no experience with the recession operation which Dr. Townes employs, I can readily understand that a graduated tenotomy might be feasible, especially when the antagonist of the strong muscle brings about a fair rotation of the eye. The difficulty of applying the scleral or episcleral sutures is the only objection that I could offer to the Jameson method.

In regard to the age when glasses should be prescribed; I agree with Dr. Pirkey that glasses should be used as early as possible. If we think it is safe to put glasses on a child one year old and we can get the child to wear them, it is the proper thing to do for the earlier we correct the muscle imbalance the better. Theoretically it would be proper to put glasses on a child while at the breast, but practically this is impossible for many reasons. It is a difficult matter even at one year, and I hardly believe that Dr. Pirkey will induce many children one year old to wear glasses. It is my practice to wait until the child is about three years old, although I have, in manageable children, prescribed them at two and one half years.

The points of practical interest that I tried to make about squint are: to inform you as to what is being done at the present time for these crossed eyes; to discredit the theory or impression that squint will eventually correct itself and

that we cannot trust to luck in these cases; that operative treatment for squint should be instituted as early as is possible under local anesthesia, the choice of method being left to the operator.

I am glad that Dr. Pirkey reimpressed the fact that an individual with a deviating eye is handicapped both socially and economically.

FORUM

TO THE EDITOR:

Why all the howling about the shortage of doctors in the mountains of Kentucky?

In regard to an article which appeared in the September 4th, edition of the Louisville Herald Post concerning a school for rural doctors, I hereby oppose such an institution. To my way of thing, a movement like this, whereby doctors can be made overnight would be very unjust to the splendid people of the mountains as well as to the people of the State and especially to the physicians who are now practicing, and who will practice in the future.

This article states that after a short term in some medical school, these doctors could be sent to the mountains of Kentucky for a period of five years, and then locate anywhere in the State of Kentucky they choose under the same certificate. I am confident in the first place that a man who would appear for this course would be a very inferior type of young man, and having completed his course, would still be inferior to the doctors who are practicing today.

It has taken many years of hard labor and a vast amount of expense to bring the medical profession to the high standard which it now obtains, and the turning loose on the public a bunch of men like this school would turn out, would be degrading to the medical profession indeed.

It has often been said that the dog that is being kicked is the one that is doing the howling—but I want it understood that I am not being hit, and will not be possibly by this Act of the Legislature, if this Bill passes. Without the least degree of boastfulness, I have a comfortable country practice, and have had for a number of years.

It has been my pleasure and privilege to associate with two or three professional men who were born and reared in the mountainous section of the State, and from the information gained from them, the people in the mountains are receiving just about what they want. Then, why all this howling about the people in the mountains of Kentucky? It appears to me that those who are in authority lose sight of the fact that conditions over the State are not what they were twenty or even ten years ago. Hundred of miles of splendid roads are being built throughout Kentucky each year, and with the aid of the au-

tomobile, which is within reach of every doctor, one physician can do as much today as five could with the old system of travel.

Twenty years ago in Washington County, Kentucky, there were sixteen physicians in active practice. Today there are only eight, and if anyone in the county is suffering from lack of medical aid, who is worthy of such aid, I do not know it. I cannot speak for the other physicians of the county, but with the aid of the automobile, I spend twice as much time at the office as before and more on the outside.

Another large factor in the medical profession is the hospital, which is found in every town of almost any size in Kentucky. This is a great aid to the doctors as well as to the public, and applies to the mountain regions as well as to the Bluegrass section.

Another marked factor is the decrease in the birth rate. The birth rate for 1928 was the lowest Kentucky has had since birth registration was begun in 1911. It appears from reports received that in 1929, it will be even lower than last year. Some diseases, such as typhoid and malarial fever are practically things of the past. Chiropractors, chiropodists, etc., are doing a great deal of work. Druggists all over the country are prescribing over the counter. Flying machines are becoming a necessity as fast as time will permit them. All of which, tends to establish the fact that we do not need as many doctors as formerly.

A young man from this town and county, recently graduated in medicine. Having spent \$14,000.00 or more on education and preparation, he was desirous of finding a location. He was of the opinion that there was a scarcity of doctors, but after spending three or four weeks looking for a location, decided that the profession was crowded. The statement referred to in the beginning of the above mentioned article states that there is only one physician to every twenty-five thousand people in the rural sections of the State. I have no desire or right to question this statement, but I do think there is another count due on this particular subject.

Every county in the mountains of Kentucky has mines of some sort, and some, a great number of them. As practically everyone knows, the owners of these mines employ physicians and pay them a specified price each month to attend to the physical needs of their employees with the privilege of doing as much outside practice as they desire. In this way a great number of mountain people are cared for medically. Moreover, there are doctors located all through the mountains in active practice, and I truly believe that the scarcity of doctors in the rural sections of the State is overestimated. I know that the scarcity of nurses is greatly overestimated, or statistics will show that there are now more nurses for the population than ever before.

Therefore, I see no need of all this howling about the scarcity of doctors and nurses.

The medical practitioners we have are inaccessible. They cannot advertise. "The American Medical Association" will not list them in accordance with their competency; it lists them in accordance with whether they pay their dues or not. Everyone of them who can pay his dues is listed. Dr. Grady tells us in the Chicago News "How to Choose a Doctor," and the New York State Department of Health Radio broadcasts "What Doctor Shall we Call?" You find out how you may distinguish an honest from a dishonest doctor, only after you have found him. You are not told how to find him, though you are advised to avoid the sensational doctor, and not to be impressed by the elaborateness of offices. Many people who go to clinics, remark that they did not know how to find a good physician; public health nurses are stopped on the street to make recommendations, and the Corner Druggist refers you to the doctor who sends him the most prescriptions. Meanwhile quacks and cultists hang out electric signs and grow rich. Why must a man keep the fact that he is a good physician a closely guarded secret in order to be "ethical" in the eyes of his association, whose Journal advertises patented articles of all sorts?

It is true that there are inaccessible doctors, but I believe everybody in Kentucky is receiving medical attention better than ever, provided they are worthy of it. I sincerely hope that every doctor in every County of the State will see that its representative votes against this bill when it comes up in the Legislature in 1930.

M. R. THOMPSON, M. D.

BOOK REVIEWS

NEUROLOGICAL EXAMINATION. An exposition of tests with interpretation of signs and symptoms. By Charles A. McKendree, M. D., Associate, Department of Neurology, College of Physicians and Surgeons, Columbia University. With a foreword by Henry Alsop Riley, M. D. 12mo of 280 pages with 88 illustrations. Philadelphia and London: W. B. Saunders Company, 1928. Cloth \$3.25 net.

The purpose of this book is to familiarize the medical student and those interested in post-graduate specialization with a comprehensive and systematic form of examination of the central nervous system. An attempt has been made not only to describe the various tests, but also to make it clear why such tests are applied, and to correlate abnormal findings with the symptoms expressed. The abnormal reactions are interpreted as pertinent pathological expressions of interference with anatomical relations and physiological functions, in such a way as to give to the student clinical pictures of pathology which he may

readily understand and group under various syndromes.

No attempt is made to classify or describe disease pictures, but many important syndromes which have localizing value are described in connection with the tests applied.

SURGICAL PATHOLOGY. By William Boyd, M. D., Professor of Pathology, University of Manitoba, Winnipeg, Canada. Second Edition, Revised and Reset. Octavo of 933 pages, with 474 illustrations and 15 colored plates. Philadelphia and London: W. B. Saunders Company, March, 1929. Cloth, \$11 net.

The entire book has been reset. Whole sections have been rewritten, others have been recast, and extensive and important additions have been made to practically every chapter. There have been added 130 new illustrations.

To be more specific: The chapters on the thyroid and stomach have been rewritten, as have the sections on the etiology of tumors, including melanomata, lymphosarcoma, tumors of the testicle and of the kidney, carcinoid tumors of the appendix, and endometrial implants.

Another new chapter gives practical suggestions as to how the surgeon may utilize the assistance of the laboratory. The chapter on the spleen has been recast and includes Barcroft's physiological researches. The classification of the glioma group has been recast on the basis of Bailey and Cushing's work. The section on malignant tumors of bone has been rewritten, reflecting the new information obtained from the Registry of Bone Sarcoma of the American College of Surgeons. Among other new material may be mentioned Cadham's work on the treatment of septicemia, tissue cultures, precancerous lesions, carotid body tumors, tumors of the xanthoma group, pituitary tumors, diverticulosis and the pre-diverticular state, Wilkie's work on the etiology of chronic cholecystitis, Counsellor and McIndoe's work on hydrohepatosis, chronic serous arachnoiditis, etc.

Treatment of Ulcers of Leg with Magnesium Sulphate—Young reports that the use of magnesium sulphate solutions in the treatment of ulcers of the leg has resulted in healing in more than 80 per cent of cases. The patients were all confined to bed with the foot of the bed elevated. Soaks of a 5 to 10 per cent solution of magnesium sulphate were applied and the dressing was renewed thrice daily. A considerable number of similar and varicose ulcers were treated in the same fashion with excellent results.



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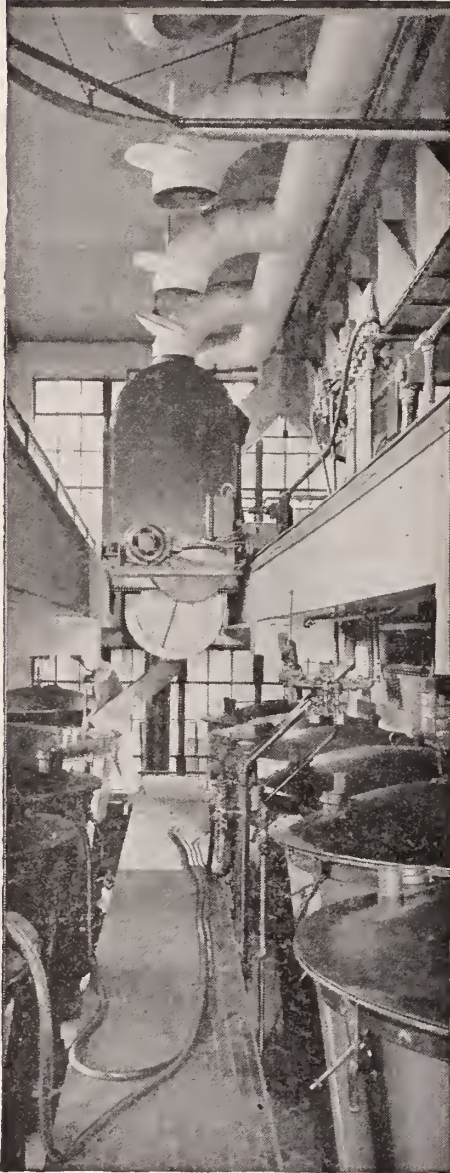
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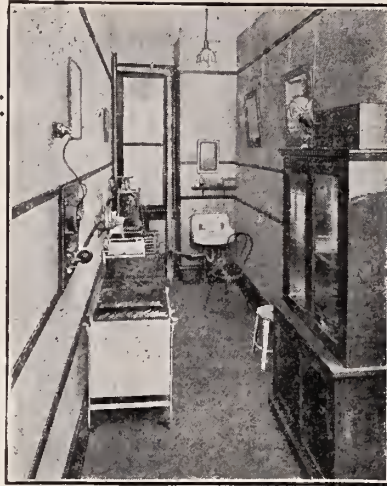
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EDITORIAL

THE ANNUAL MEETING

Every one who attended the Annual Session in Louisville this year felt that Doctor Hanes had attained his ambition to make this the most outstanding meeting of the Session in its seventy-nine years.

The total registered attendance was six hundred and ninety-two, the largest number registered except in 1919 when we had our historic War Meeting.

Every paper on the program was presented. They were of uniform excellence and presented a real post-graduate course. An attendance of two hundred and twenty-two throughout the third day was an especial tribute to the symposia on influenza and obstetrics and set a record for all time.

The public addresses by Drs. Chas. H. Mayo and Morris Fishbein, before an attendance composed, in addition to the members of the Association and the Auxiliary, of the leaders of public opinion in Louisville, was one of the most brilliant occasions in the history of this Association. The beautiful auditorium of the Knights of Columbus was crowded to capacity and the addresses which will be published in early issues of the JOURNAL, were of the first order of excellence.

The unanimous elevation of Doctor W. B. McClure, of Lexington, to the Presidency was a recognition of the affection and gratitude of the medical profession of Kentucky to one of its best beloved members. Doctor McClure has been Treasurer of the Association for twenty-six years, the longest term served by any elected official of any state medical association in the United States.

Recognizing the excellence of the program, Doctor McClure announced before the conclusion of the meeting that Doctor C. W. Hibbitt would be continued as the appointive member of the Committee on Scientific Work to arrange the program for the Bowling Green Session in 1930. Doctor Hibbitt will have the benefit of the same group who devoted such thought and energy to the preparation of the program this year.

The proceedings of the House of Delegates were of great importance and should be read by every physician in Kentucky. The unanimity and harmony of the proceedings were noteworthy.

The orations, addresses, essays and discus-

sions of the Scientific Session will be published in an early issue of the JOURNAL and will be eagerly looked forward to by all of our readers.

The Association expressly indicated its appreciation of the fine publicity given the meetings by the newspapers of Louisville and of the State. No previous Session has had such widespread public recognition.

THE AUXILIARY

We are sorry that all the wives, mothers and daughters of Kentucky's physicians could not have been present at the fine meeting of the Woman's Auxiliary of the Kentucky State Medical Association during its recent Louisville session.

The growth of this very effective group has increased by leaps and bounds since its organization at Crab Orchard Springs a few years ago and many older organizations could learn a great deal from the smoothly efficient conduct of its meetings. It has already developed an effective leadership, and while, of course, many of its members who have joined recently are still wondering what it is all about, the older and more experienced ones have developed fairly definite plans for public education as to the value of scientific medicine that are tremendously interesting to the physicians who have taken the trouble to find out about it.

Of particular value was the fine address of Mrs. George H. Hoxie, of Kansas City, President of the Woman's Auxiliary of the American Medical Association. Our readers are urged to take their JOURNALS containing minutes of the meeting and the several addresses home with them so that their wives, too, may become interested.

The address of the retiring President, Mrs. J. T. Reddick, told of the accomplishments of the past year, and the incoming President, Mrs. P. E. Blackerby, of Louisville, made the subject "The Responsibility of Women for Good Health" so fine a message that the Council of the State Association has ordered it published and distributed to all of the women of the State.

Many counties in the State have yet to formally organize their Auxiliaries. From almost every county, however, some of the doctors' wives have joined as members-at-large, and a nucleus is being secured which

will soon reach every county in the State. Thus another link is being forged in the strong organization that the medical profession is making for the purpose of securing better health and better medical service for all the people.

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In Kentucky in 1928 there were 165 deaths from Pellagra. Pellagra is not infectious or contagious and yet our records would indicate thousands of cases. Success in the treatment of this disease depends a great deal on the early diagnosis. Investigations by the late Dr. Goldberger of the U. S. P. H. S. have proven that Pellagra is due entirely to faulty diet.

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CHRISTMAS SEAL SALE

Christmas with all its glories is coming to us again. Among the numerous joyful opportunities of this happy occasion is the Christmas Seal sale of the Kentucky State Tuberculosis Association. It has become the custom to place these little omens of good will on our letters, packages and cards. It is really an important step in the evolution of Christmas gifts. The main objective of the Christmas gift is to make the recipient happy. The seal on the gift makes it more intimate and personal.

These seals not only carry a message of good will and good wishes but, at the same time, they can also be the means of bringing happiness and health to others. Is this not the finest exhibition of Christmas spirit? A dollar or a few dollars worth of Christmas seals will supply the needs of each giver. The aggregate of these seals not only supports the work of the State Tuberculosis Association but gives that little flexible surplus to the health work in the several counties of the state that increases their effectiveness out of all proportion to the aggregate amounts. Our health departments are meagerly supported with the

bare appropriations which enable them to function. The additional money that comes in from the Christmas sale enables them to do more effective work in the reduction of the sick and death rate from tuberculosis. The clinics, held this year, have found dozens of cases that otherwise would not have been under the scientific care of the physicians. The bloom of health is on the faces of thousands of our people because of previous successful seal sales.

This year, we speak for the profession,—its solicitude for the success of the 1929 campaign, and we urge physicians everywhere to help our people realize the importance of this opportunity to help the whole movement in which we are all interested.

THE GOLF TOURNAMENT

Dr. D. Y. Keith, Secretary of the Golf Club of the Kentucky State Medical Association, announces the following results of the golf tournament played at the Louisville Country Club during the State Meeting.

The Blue Grass Flight was won by Dr. O. F. Hume, of Richmond. The trophy, a silver pitcher, was donated by the Brown Hotel Co.

The Pennyroyal Flight was won by Dr. R. G. Spurling, who was tied with Dr. C. D. Townes, Dr. Spurling winning on the flip of a coin. This trophy, a sterling silver vase, was donated by Dr. G. S. Hanes.

Trophies in the Kicker's Handicap were awarded as follows: Dr. J. Allen Kirk, silver pitcher, donated by Jones Apothecary; Dr. I. T. Fugate, Fountain Pen Desk set, donated by Newman Drug Co.; Dr. James R. Stites, Physician's Bag, donated by Brooks Denhard Surgical Instrument Co.; Dr. J. C. Bell, Physician's Bag, donated by Theo. Tafel.

Shaw-Mackenzie Test for Cancer.—Two hundred serums have been examined by Watchorn by means of the Shaw-Mackenzie test for cancer. In seventy-one cases of malignant growths the test was positive in forty-nine, doubtful in five and negative in seventeen. Epitheliomas of the skin all gave negative results, and some cases which had been treated with lead, roentgen-rays or radium, and some cases of advanced inoperable carcinoma in old people also showed negative results. In 102 cases of various diseases other than growths (malignant or otherwise), negative results were obtained in sixty-five cases while nineteen were doubtful and eighteen were definitely positive. The chief conditions likely to give wrong positive reactions are venereal disease, heart-disease, nephritis, pulmonary tuberculosis, pregnancy and menstruation. A 1 per cent solution of chlorine hydrochloride gave results similar to those obtained with the carcinoma extract.

ORATION IN MEDICINE

THE PUBLIC'S OBLIGATION TO THE MEDICAL PROFESSION*

By E. L. GOWDY, M. D., Campbellsville.

Last year most of the profession of my town packed up their troubles in their old kit bag, hid themselves to the Madison County capitol, and left myself and a colleague with the bag to hold. The next report I received from the Richmond meeting was that I had been chosen your orator of medicine. A few years ago, one of our ancient citizens, one of the last surviving gentlemen of the old school in my native town of Campbellsville, after a sojourn in a neighboring city, was asked what was the most beautiful thing in Campbellsville. His reply was, "The way our doctors love one another." I would be willing to hold the kit bag of all the doctors in my county if it would give them the pleasure of attending a meeting of the State society, especially if the compensation is the distinction I have received. The Kentucky State Medical Association is a society in which every member takes a great and just pride. It is a society I have loved and esteemed since I started the practice of medicine, and to have the honor of orator of medicine conferred upon one so unworthy as myself by this wonderful organization is a pleasure for which I cannot help at this time but to express to you my heartfelt gratitude and sincere appreciation.

The last quarter of a century has seen some rapid, startling and serious changes in the practice of medicine. Twenty five years ago these changes were sensed even in the numerous second-rate medical schools of the period; today they are seen and felt, not alone by the urban physician, but by the most obscure country practitioner, wherever he may be. The problems arising from these changes, especially their effect on the physician of the future, have been in the minds of sincere and conscientious physicians and economists for several years; they have been a favorite theme for discussion in medical societies, and a frequent subject of the addresses of presidents of these societies. Nevertheless, the changes continue and the problem is still unsolved, and this is my reason and apology for again calling it to your attention. I wish to say, at this point, I have no solution for the situation, and for this reason this address may lack power, or "punch," or even interest, but since you have chosen a rural practitioner as your orator of medicine, I shall give you a few observations as to how these changes af-

fect the country doctor and the rural public, although they will apply to urban centers as well.

The progress of science in the last few years has been the most rapid and wonderful of any period in the history of the world. Medicine has more than held its own with these advances, and it is not only to be looked for but expected that this Golden Age would make changes in the personnel of its practitioners. Science has rapidly cut down the barrier between city and town and country, so that today every rural village has among its own the most modern and up-to-date automobiles; high powered electric lines weave a web over the state, bringing to the rural dweller the joys of the many labor-saving electrical devices, the pleasure and instruction of the radio, the talking picture, and other appliances heretofore enjoyed only by his city brothers. Just as the people are no longer content with old fashioned methods of farming and business, they are not content with the old-fashioned doctor. The family doctor, that bulwark of medicine for hundreds of years, is losing his grip. Although ridiculed, either veiled or openly, from certain sources, even among the profession itself, he is more efficient today than he ever was, he is still the *sine qui non* in the much talked of wonderful strides of preventive medicine, he seems well nigh indispensable to the many communities in which he serves. Nevertheless, among the most tragic of the statistics of late years is the fact that the average age of Kentucky's general practitioners is nearly fifty-three years.

Many medical men still contend that there is no real shortage of medical service. Even so interested an observer as the Journal of the American Medical Association has contended over and over again editorially that while there may be a shortage of general practitioners, because of the advent of good roads and the automobile, the rapid rise of preventive medicine, community health centers, county hospitals, and various other agencies, there is no need of so many general practitioners as formerly. However, to one who has practiced all his life in the rural districts, who sees his confreres growing into a body of old men whose numbers are dwindling and no new material coming on to take their place; who sees the more active of his remaining colleagues, even with the help of the so-called good roads (more in the imagination of those who think they know than in reality) and the automobile, overworked and wearing themselves out in the service of humanity; who sees older doctors, men in many instances on the sunset trail, burning the candle of life at both ends to live up to the traditions of their profession, he is not only skeptical about any

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solution that has been offered but wonders what the end will be and who and what is responsible for bringing it all about.

There is no doubt but that the profession itself has had a lot to do with changing medical standards. It starts with the method of teaching in the medical schools, and is encouraged by the advice of the teachers themselves. General practitioners, with their altruistic concepts of duty, have been responsible in a small measure to the dwindling in their ranks. But if we review for awhile what the medical profession has done for the public, and then, by way of contrast, sum up how the public has fulfilled its obligation to the medical profession, I think we shall see that the public has not only kept faith with medicine, but is in no small measure responsible for the very things for which, in this present day, it so bitterly criticises and condemns.

It has been said over and over that the practice of medicine is as old as the dawn of human intelligence; that the first doctor was some cave man, in whom suffering first kindled in his mind emotions of pity and sympathy. Whether his ministrations took the form of incantations to drive out evil spirits, whether he offered some blood sacrifice or performed some surgical operation does not matter. He must have done his work earnestly and sincerely, for it was in such a beginning that the germ of the practice of medicine was born. But the first doctor had to have more than sensations of pity and sympathy kindled in his heart; he had to have a sense of obligation and responsibility. It was not enough to watch his fallen comrade writhe in pain and feel sorry for him—he had to take him to the nearby cave and minister to him and look after him. This he undoubtedly did, for thousands of years before any written records of the most ancient of all medicine, the Chinese and Egyptian, were handed down to us, we know from bones discovered of these ancient people that many wonderful surgical operations were performed. Skulls have been found where new bone had been put in to take the place of that destroyed, long bones were set, and amputations done. We can also read from the bones that the doctors of that time had many successes, for the bones would knit together—we also know of their failures, as the bones did not heal and the patient died. Some among these savage tribes, either through sympathy or skill, became more proficient than others, and they were gradually elevated in the hearts of the people and became the priests whom the people almost worshiped and adored.

From those ancient days the doctor has had a very superior place in the lives of people. He has gladly accepted the obligations and

responsibilities handed down to him through the years and to this good day lives up to the traditions of his profession, knowing full well that the prizes the world awards for his self-sacrifice and martyrdom are not great. The public has not learned to appreciate the courage that causes hundreds of physicians to expose themselves to infections such as plague, cholera, yellow fever, influenza and other forms of lingering disease and death in their devotion to the ideals of medicine. The doctor takes great pride in the names of Hippocrates, Galen, Harvey, Hunter, Jenner, McDowell, Pasteur, Lister and others who have done so much for the cause of humanity. Yet, who among the rank and file of the great public have even heard of these men? Ask any high school boy the name of a great statesman, and a dozen will appear before his mind; ask him the name of great inventor and he has a host at his disposal; ask him the name of a great author or soldier and scores of names are at his command; ask him the name of a great doctor—he may know that Oliver Wendell Holmes wrote the "Autocrat of the Breakfast Table," but he does not know that he was a practicing physician whose observations have been of untold value to humanity. He knows that Daniel Webster was a great American statesman, but he does not know that Crawford W. Long, a country practitioner from Georgia, was the man responsible for the blessed anesthetic that has made modern surgery possible.

In the town of Danville, Kentucky, there rises a modest stone, marking the last resting place of one of the world's great doctors. Across a short stretch of ancient graveyard the shadow of this simple shaft in the setting sun would almost touch the campus of one of the most famous institutions of learning in America. From its halls have gone many of the moulders and makers of our country. Its student body, always small in number, is made up for the most part of unusually high grade men; a large per cent of its enrollment is composed of scions of fathers who themselves have graduated from its halls. Yet these boys for the most part pass the grave of this great pioneer daily, and, if they know his grave is there at all, to them Ephraim McDowell is just another doctor.

Ignorance on the part of the public of the struggles and traditions and ideals of medicine is another thing that is leading to the ever widening misunderstanding between the profession and the public. One would think, with all the beneficent health laws on the statute books, that the public has awakened to a true appreciation of public health and preventive medicine. However, they were not put there by the public, but in most instances, by hardworking self-sacrificing mem-

bers of state medical societies. In fact, the public shows very little interest in the statutes in regard to public health. A political campaigner with some good health measure as an issue is likely to find himself more handicapped than blessed. A State Board of Health may build itself into a most extreme degree of efficiency, it may become a mighty power in protecting the health of the people, and the more proficient it becomes the harder it has to fight, not only to maintain its effectiveness but for its very existence..

Let some conscientious county health officer force compulsory small-pox vaccination on rural school children—he may be laying up for himself treasures in heaven, but he is sounding his death knell as a practitioner of medicine in that community. It has been estimated that if left to the soldiers in the late war, less than ten per cent would have voluntarily availed themselves of the protection of typhoid inoculation. It is a comparatively easy matter to have a law enacted to prohibit and punish the roving cancer quack, but a difficult, almost impossible task, to get a grand jury to indict him, a procedure that is necessary if he is to get his just deserts. Any lawyer will admit that in malpractice suits, no matter how beloved and respected the doctor may be, no matter how unjust the suit, a jury is always an uncertain proposition. A legislature will willingly pass laws increasing the standard of medical education, donate large sums for the maintainance of hospitals, and for colleges teaching these high standards of medicine; they will more willingly grant licenses, and even equal rights with these high-type regular doctors they have demanded, to osteopaths, chiropractors, or any other flimsy quackery that makes a fight for them.

This is one part of the public with whom the general practitioner has to deal. He has met the situation in his own way, but with the changing methods of medical practice, with the publicity and propaganda devoted to medicine by certain individuals in an attempt to enlighten this public, is it any wonder that the old family doctor finds himself slipping from the high estate he formerly held? "A little learning is a dangerous thing," at least it is to the old family doctor, and who knows, because of his elimination, it may prove a dangerous thing for the people, especially the rural people, whom he serves.

The border line between superstition, quackery, and credulity is so narrow that it is often hard to differentiate the terms when applied to cases in general, as the human being has so much of all three in his make-up, whether he be the lowly peasant in the fields, or the giant intellect in science, art and letters. The refrain from Kipling that the "East is East and West is West, and never

the twain shall meet" is incorrect in that the East and West have a common meeting ground in their belief in magic, the unnatural and unexplainable things of life. In the East they have the magician, the charmer with his tricks, and the mystic priest with his incantations. In the West we have their prototype in the Christian Science pow-wow, the chiropractor with his adjustments, and the patent medicine quack.

However, it has always been an outstanding characteristic of the human race to believe. This tendency to believe often assumes the mantle of fanaticism but more often is governed simply by credulity and superstition. The primary tendency to belief is in a Supreme Being, a belief so universal that down the dim trails of history it shines out after all other vestiges of ancient civilization are only a surmise and myth. The most ancient recorded civilization that the world knows, was the Coptic civilization of the Nile Valley. All that is left of this civilization is the ruins of their temples to their gods, and all that we know of these ancient people are the conclusions we draw from the religious beliefs and rites that have been preserved for us. But science has taught us that while the Copts were worshipping their gods in the valley of the Nile, at least hundreds of years before, Nebuchadnezzar built his famous hanging gardens in ancient Babylon, the Aztecs in Mexico and Incas in Peru had a high degree of civilization, and outstanding over all evidence of this civilization is the belief of these people in a Deity. The religion of Confucius and the mythology of the Greeks and Romans have been preserved almost intact. Columbus found the religious instinct of the American Indian highly developed, and one of the first things that confronts the traveler in the Arctic, is the totem poles of the Esquimaux, created to the spirits of good or evil. Over the world in our own day we have the gods of Buddha and Mohammed, with more converts than Christianity enjoys. Thus, it will be seen that through the ages the normal instinct in the human breast is to believe something, and a close second to religion is the credulity and superstition attached to medicine. We have remarked above how closely religion and medicine were associated, in that the priest was always the doctor, and today many of the healing cults that spring up have their basis in their conception of religion. However, there are hundreds of harmless superstitions that are sincerely believed by the public, not necessarily the ignorant public, for we can remember when children of the "best families" wore asafetida bags around their necks to ward off contagious diseases, and only yesterday, as it were, the clientele of the Abrams scheme was chiefly

taken from the ranks of the elite. The fault was not with the scheme; Abrams had just what the people loved; he made the mistake of carrying it to the point of being absolutely ridiculous.

Twenty-five years ago we longed for the day when education would deliver the people from the bondage of quackery which fed upon them. With pleasure we saw, with the advancement of education, the old medicine show with its negro minstrel and crude jokes disappear from our midst. Dakota Ray, the Quaker doctors and the Kickapoo chiefs are things of the past, although Nevada Ned, one of the greatest of them all, in an interview a few weeks ago remarked: "I have no idea what the year 2130 will be like except that I am sure of three things—death and taxes will operate, the Younger Generation will be viewed with alarm, and 'Nature's own remedies' will be sold in the streets." He may be right. There is less of the song and dance and ballybhoo, but Nature's own remedies are still sold on the streets, although the medicine men of today find the radio and newspapers and magazines in co-operation with the drug stores, though more expensive, a much more effective method of fooling the public.

The educator will insist, and truthfully, that education has also kept pace with the time. Nearly every county seat now boasts a beautiful high school building. High schools that a few years ago had enrollments of ten to fifty, now have one hundred to five hundred. Our colleges and universities that a few years ago had three hundred to five hundred in attendance, now have three to five thousand. The product of these schools may not buy medicine from the street peddler or order electric belts, but we must not forget that the poor, the ignorant, and the uncultured are not the only ones the chiropractor depends upon for a living or Christian Science expects to advance its propaganda. It is a well known fact that many of the new cults and sects, especially those in regard to healing, are drawing a large per cent of their converts from the colleges and universities.

Unlike the science of medicine, which is not the work of one man or generation of men, which, through the ages of civilization, adds, one medical discovery to another, proving it true or false, accepting or rejecting it, till at last it has reached its present high degree of perfection, credulity we have with us always, unchangeable and unexplainable. "There's nothing new under the sun" said Solomon, the wisest of kings. Several hundred years later the humble dressmaker of Marie Antoinette, when demanded by the queen to produce a gown of new and original creation, replied: "Madam, nothing is new but what has been forgotten." Whether it

be the hiera piera of the ancient Egyptians, the bezoar stones, medicine rocks or dried mummies of the middle ages, or the Christian Science or chiropractic craze of today, it is all the same, has endured and shall continue to endure till "kings and realms and governments of earth shall have passed into darkness and are lost."

Another thing that is weaning the public from the general practitioner is the activities of health officers, community nurses and community health centers. In the cities especially we have various groups or clinics, very often supported and controlled by laymen. There is no doubt but that these institutions do a great deal of good and in many cases are a boon to poor people, but it remains to be seen whether the good offsets the harm done by causing the loss to the people of the conscientious family doctor. A man, when he is sick, wants individual attention and individual treatment. He wants a treatment that he can feel is aimed at the seat of his trouble. It is this psychology that is largely responsible for the success that chiropractic and osteopathy enjoys. If he comes to a doctor, the average man still wants his throat swabbed, some mercurochrome put on his cut, or a bottle of medicine or pills to swallow. Are the credulous and ignorant going to be satisfied with the same routine employed in vaccinating hogs against cholera or testing cattle for tuberculosis? When they are ill, are they going to be satisfied with the routine attention of a salaried employee? Or are they, when general practitioners are gone, or are too few to look after all the people, going to demand their legislators to allow osteopaths and other cults to prescribe narcotics and practice obstetrics in order that they might get individual attention, and thus allow the country to be flooded with ignorant, incompetent, pseudo-medical practitioners?

Why, one may ask, do these things affect the status of the present-day practitioner? Ignorance, antagonism, credulity and supersession we have had with us always. Since his numbers are dwindling and no new men are taking his place, are his methods out of tune with the times, or is there something wrong with the practitioner himself? The answer is that while human nature does not change, the manners, customs, thoughts, loves and desires of people do change, and it is these changing manners and moods in regard to medicine that is making the problem that is up to the physician to solve.

Changes in the profession itself are causing the public to lose its respect for the general practitioner, and treat lightly its obligation to him. This change, as stated above, undoubtedly had its beginning in the medical schools, and medical schools have come into

their share of severe, and often unjust criticism. A quarter of a century ago it was taught that medicine, in all its phases, was too big a subject for any one man; now we are told it is impossible to graduate an efficient general practitioner after a course of four years. However, most of the critics insist that we must have general practitioners. Here is how Dr. E. A. Graham of the Washington University School of Medicine solves the problem: "We shall, however, always need general practitioners who can care intelligently for the less dangerous common ailments of mankind, including some minor surgical conditions. These men will not be general practitioners in the sense of a generation ago, but they will act more in the capacity of distributors of patients among those who are better qualified to diagnose and treat the more complicated conditions. For example, the practitioner does not need to have the ability to make an exact differential diagnosis of every acute intra-abdominal lesion. All he needs to know is to recognize that an acute abdominal lesion is present, and that a surgeon should see the patient. Also, that it is not necessary that he should be able to make an accurate diagnosis in a case of chronic indigestion, but rather that he should know where to get help."

This is, indeed, a very remarkable paragraph. Can any practitioner, especially a country practitioner, visualize a patient coming to him with an earache and paying him a fee to tell him to see an ear specialist, or some one making a trip to his office with the stomachache in order to be told to go to a surgeon?

Nevertheless, there is a growing tendency both on the part of the specialist and the public to underestimate the ability of the general practitioner, and it is this improper estimate that makes one more item in the wane of the family doctor. The medical student is told of the kindly old country doctor who nurses a woman, after confinement, through three or four weeks of illness, receives great praise for his loyal care and attention, although, after all, she succumbs to childbed fever. He is told that little Willie is given a soothing cough syrup when he had the measles, although he could have gotten along just as well without it. Well, who knows he could have gotten along just as well without it? Why should it be assumed that the average practitioner, who probably does as much obstetrical work as the average obstetrician, is incompetent because a patient dies of childbed fever? He is not told that statistics prove that the mortality in obstetrical practice is less among general practitioners in the country than from any other source. In order to offset this peculiar discrepancy, it

has been ridiculously argued, even in medical societies, that the reason is that the practitioner was often ignorant of the cause of death, and did not sign the death certificate correctly. It is true that several years ago there were scores of second-rate medical schools that turned out hundreds of second-rate graduates, many of whom are still practicing. However, most of them have made *useful* physicians.

The average practitioner, no matter from what source he received his training, has his five senses, he still finds a watch and thermometer useful, he makes frequent and remarkably reliable urinalyses, he has a stethoscope, a sphygmomanometer, and a haemacytometer is usually close by. He can intelligently treat ninety per cent of the cases he sees. The ten per cent he cannot treat he usually refers to those who can. Of the ninety per cent he intelligently treats, not more than ten per cent can be affected by preventive medicine, in the present meaning of the term.

Still, as remarked above, the medical schools are not turning out general practitioners. Sir Isaac Newton once said words to the effect that a man does not begin to grow mentally till he knows his own limitations. Even with the advancement of the science of medicine, to admit that the medical school of today, with its wonderful equipment, its enlarged clinical facilities and high type student body, cannot turn out competent general practitioners, is a confession that something is wrong either with the method of teaching, or the conception of what it takes to become a general practitioner. Today, large numbers of America's greatest doctors are the products of second-rate medical schools that are no longer allowed to exist. The fact seems to be lost sight of that it is not the stocking up of the mind but the working of it that counts; that a man may have even a haphazard medical education, and through native intelligence and industry, achieve mental assets that will make him useful and successful in whatever branch of medicine he chooses to enter. Ralph Waldo Emerson, with all the advantages education had to offer, was no more a success in his chosen profession than Henry Ford, with no college training, was in his. A backwoods log schoolhouse furnished Abraham Lincoln all the "schooling" he ever received; Woodrow Wilson had every educational opportunity offered a youth of his day. These two men became America's two most famous Presidents. Some one has said: "The test of true education is not what the schoolroom does for the student, but what the student does for himself. Teachers provide his mental tools, but only he can decide how well he may use them." This applies to medical students just

as surely as it does to any other branch of education.

The real reason is that students do not want to be general practitioners. It is hard for a medical school to make a surgeon out of a student who wants to be an eye specialist; it is hard to make a general practitioner out of a boy who wants to be a surgeon. The student has sensed that what the public wants is specialists, and they are simply trying to supply the demand. The public expects a specialist for every ill, and his ability is rated by his fees. If he charges a lot, he is a good specialist; if his charges are reasonable, usually his rating isn't so good.

Today, in the most obscure country homes, a specialist is suggested or demanded for everything from a simple fracture to a case of cholera infantum. Every country doctor frequently receives letters from specialists in cities regarding certain cases who have gone without the family doctor's knowledge or advice. Do not understand these remarks to infer that, in these days of medical progress the general practitioner fails to appreciate the well trained, qualified specialist. It would be hard to get along without him, and it is a source of immense satisfaction to be able to call upon him. But the pseudo, over night specialist, created because of public demand, is a potent factor in decimating the ranks of the family doctor.

The greatest single antagonistic element to medicine today is the high cost of medical service. It has been said over and over that only well-to-do and the poor can get proper medical attention. A member of the great middle class will consult a specialist for some apparently trivial ailment. Before he knows it, he often runs the whole gamut of specialists, at heavy cost to his financial resources. Now he complains of the very condition he has created and is continuing to uphold.

Another insidious factor that is undermining public confidence in the general practitioner, is the campaign of health education as it is at present being conducted through the newspapers and magazines, and, to a lesser extent, the radio. The newspapers, as a class, have been very kind to the medical profession. It is true that bitter and antagonistic articles occasionally appear, but for the most part they give freely of their valuable space for anything the profession may have to say. Some even, in the interest of public health, refuse to take spurious medical advertisements. Twenty years ago we all longed for the time when a great health campaign could be conducted by the newspapers. However, doctors were ever modest in writing for publication. But things will take a turn. Now, every newspaper, from the metropolitan daily to the county weekly, has an article on health

in nearly every issue. Most of the weekly and monthly magazines frequently feature articles pertaining to health. Some of these articles are very valuable; the influence of others is unimportant, if not baneful. The fault is not with the idea, but with the method by which it is carried out. Many of these writers, standing presumably for the medical profession, take advantage of this opportunity to put their own interpretation on various conditions, regardless of what other doctors think, or whether it is the opinion of the rank and file of the profession. The patient, after having all his symptoms analyzed, is advised to "see your doctor." This he does and when his doctor's views do not coincide with the written word, the patient too often concludes his doctor must be wrong, perhaps not quite competent, and one more recruit is made for the specialist.

These articles are also making our patients very important diagnosticians. Most of them have acidosis, and acute indigestion is a thing of the past, no matter how much bologna sausage or hamburger and onions they have eaten the night before. Some come with gall bladder trouble or chronic appendicitis, though his doctor, who knows him well, will tell him the cutting out of the consistent use of moonshine whiskey will do his gall bladder and appendix more good than the cutting out of the gall bladder and appendix. Many women are eating liver for pernicious anemia, making the price high for those who really need it. Then, when the family doctor does not concur in their own diagnosis, the patient is not satisfied till he sees a special man.

The foregoing paragraph must not be considered as a criticism of that army of conscientious doctors and health agencies who devote so much valuable time to this work and doing lots of good with worth-while and helpful discussion. As has been said before, it is not the idea that he is at fault, but a more systematic method of handling this idea should be put into practice.

With all the fads and foibles of a changing public before our eyes, it would be unjust and unappreciative not to pay a tribute to the thousands of intelligent, sincere people who still hold the old family doctor to their hearts with hoops of steel. To them, no epic has ever been written that does justice to this faithful advisor and counselor, this tireless worker, who comes to them in midnight's holy hour, through rain and wind and mud and sleet, to rejoice with them in their joys and weep with them in their sorrows. They still love him and respect him, because they know he is a friend. The warmth of a winter's fire, after twenty-four hours of mud and night and shower and sunshine; the tinkle of the telephone bell, a summons to a pregnant mother

or a helpless babe, to an humble home or a dirty cabin that stands for home! No money compensation can pay for a service such as this, but though the road be weary, the reward is great.

O tempora! O mores! And all the while the old family doctor, the last leaf on a barren tree, watches his ideals of medicine, like the babe in the arms of old Kentucky "drifting away into the shadowy river that flows forever to the unknown sea."

Lest a strain of unintended pessimism appear in this address, and in order that it may not be like some of the specialists, who give their patients pages of diagnostic sheets, telling them all about themselves, and then send them back to their family doctor for symptomatic treatment, without suggestions, I wish to offer a suggestion that may be taken for what it is worth. As stated in the beginning, the problem is unsolved, and here in Kentucky, at least, it must be solved by the medical profession. The responsibility for the program in scientific medicine and public health has been put squarely upon the shoulders of the profession due to public confidence won by general practitioners in medicine and capitalized and enacted into laws by our wise leaders of the past. In the cities, where there are plenty of doctors and where there will continue to be overcrowding so long as the present scheme of medical education continues without modification, it is hard to comprehend the situation. It is not only unnecessary, but out of the question to think of lowering the present standards of medical education. To lower these standards would undoubtedly cause an increase in the number of medical students and practitioners, and soon the country districts would be overrun with a surplus of untrained, incompetent practitioners, just as the cities are now being overrun with scientific, half-baked specialists. It is also useless to argue that as soon as specialism in the cities reaches the saturation point, many, because of inability to earn a livelihood, will return to the country and to general practice. There are two reasons why this will not happen. In the first place, when a doctor makes a failure in his specialty, he will either quit and go into some business, or else peg along in the same old rut, trying to make both ends meet as best he can. In the second place, he would not be trained in general practice, and would be likely to make a more miserable failure as a general practitioner than in the specialty he selected. Today there are more than enough boys entering the medical colleges, who are perfectly willing to meet the present standards of medical education, to supply the demand. The standards could even be raised and there would still be enough to take care of the needs of the peo-

ple. The problem is how to make general practitioners out of them. As stated before, the public is demanding the specialist; the medical student is simply trying to supply the demand. But I am not convinced that the profession has become so commercialized but that the specialty of general practice can be put on as popular a basis as any other specialty. The crux of the situation lies in the medical school. Medical colleges should see that there are plenty of general practitioners on their faculties; the student should be given lots of bedside instruction; he should be taught that it is just as wonderful and requires just as much skill and judgment to treat a case of pneumonia as it does to remove a tubercular kidney. In lieu of so much research work and laboratory technique, he should be taught the art and science of keeping people well, and preventive medicine should have a very important place in the curriculum. Let the teachers make general practice appeal to the student by the same methods they are at present making specialism appeal to him.

County hospitals and community health centers all over the state are consummations we are devoutly wishing for. They are coming, but if they are to be real health centers and not mere invalid hotels and repair shops, we are going to have to have general practitioners to carry out the premier role in the forwarding of the scheme. In Kentucky, our health departments are controlled by the medical profession, and, if they are successful, they should be so conducted that the public will be taught the necessity and usefulness of individual ministrations of the general practitioner in medicine. Where are they coming from, these general practitioners of the near future? Cannot all of us slip a kindly word to some young man about to begin the study of medicine about this wonderful field where the harvest will be great and the laborers few? I desire to close this address with an appeal to the medical profession of Kentucky to assert its leadership so as to preserve for the public the general practitioner, that keystone in the arch of scientific medicine, and place him on that pedestal in the hearts of the people he formerly occupied.

Juvenile Acanthosis Nigricans—Pardo-Castello and Mestre relate the case of a man, aged 23 who presented symptoms of acanthosis nigricans since he was 3 years old. Evidence of an internal malignant tumor was absent. There was a decreased excitability of the sympathetic system with consequent vagotony, which the authors believe justifies the theory that acanthosis nigricans is of a sympathetic and endocrine nature.

ORATION IN SURGERY

THE HISTORY OF ORTHOPEDIC SURGERY*

By WILLIAM BARNETT OWEN, M. D., F. A. C. S., Louisville.

To review existing literature pertaining to the origin and development of orthopedics, and record the numerous diagnostic and therapeutic advances and improvements, would entail an immense amount of research and the collected data would fill a large volume. Moreover, such a presentation would be useless repetition, since each year an exhaustive "Report on the Progress of Orthopedic Surgery," in which the literature of the world is reviewed and abstracted, is published in the Archives of Surgery, Chicago, Illinois. Therefore, this address will be confined to brief items chiefly of historic interest.

As originally defined the word orthopedia, or orthopedics (i. e., straight + child), merely signified the correction of deformities of the osseous system, particularly of the spine and lower extremities, encountered during early childhood. The definition of the term, as now expanded, includes: The diagnosis and treatment, by surgical, manipulative, mechanical, physiotherapeutic and other approved methods, of all injuries, diseases, defects and deformities of the skeletal structures and their tendinous attachments whether acute, chronic, congenital, acquired, traumatic or otherwise in origin, and irrespective of the age of the individual.

Until a comparatively recent period, the practice of orthopedics was considered as an essential part of the work of the general surgeon. Within the last few years, however, orthopedics has been partially at least divorced from general surgery. Orthopedic surgery has become an important specialty, and the competent orthopedic surgeon is a valuable asset to every community. Some one has facetiously remarked: "There are two general class of surgeons, viz., plumber surgeons, and carpenter surgeons." And as Dr. Clarence Starr once said: to become a competent orthopedic surgeon, a man must first be a good general surgeon, then receive special training in orthopedic surgery.

There are ample reasons for believing that both major and minor skeletal defects have occurred with greater or lesser frequency since the beginning of human history, since that remote period when man abandoned his arboreal habits and began perambulating in the erect posture, since the time when physi-

cal and mental disabilities were attributed to the wrath of outraged deity or to extraordinary astrologic excursion. No record can be found to indicate that our reputed simian ancestors were similarly afflicted.

In ancient Egyptian history there are described splints of palm fiber which were used to maintain apposition of fractured bones, and examination of mummies shows that in many fractures so treated the limbs did not escape shortening. Smith and Ruffer, in an interesting monograph, mention an undoubted case of spinal caries (Pott's disease) in a mummy of the twenty-first dynasty, 1000 B. C. The following statement is made by Dr. Little: "Recent discoveries have taught us that the ancient Egyptian physicians were also skilled surgeons who applied splints and bandages *secundum artem*. We do not, however, know anything about their treatment of deformities. As to the many thousands of years of prehistoric civilization which must have preceded Egyptian, Mesopotamian and Central Asian culture, which have left no trace behind, they offer free scope for conjecture, but no facts."

In the chapter in his book devoted to the history of orthopedics, Hoffa states that in one of the ancient Indian works, the *Ajurveda* of Susruta written about 800 B. C. there is to be found a theory of the etiology of congenital defects and advice concerning the use of massage.

Among the early Greeks the custom was to destroy deformed infants, yet Hippocrates described spinal curvature, club foot, and congenital dislocation of the hip. He recommended gymnastics to strengthen the healthy, and treated certain deformities by bandaging and the use of machines; but it is not recorded that he had recourse to surgical operations. One of his machines,—the *Scamnion*,—a crude extension table for treatment of fractures and dislocations, continued in use for centuries. He also directed attention to the necessity of early correction of spinal and pedal deformities in children, and was the first to suggest that spinal caries was scrofulous (tuberculous) in origin. Probably the earliest reference to the employment of an orthopedic instrument, if artificial limbs be excluded, is a leg support mentioned in the comedies of Aristophanes, about 500 B. C.

In ancient and even in more modern times, isolated nomadic tribes have maintained primitive and curious orthopedic practices. Their method of reducing hip joint dislocation is certainly original. The patient is sweated and starved for three days in a darkened room—the atmosphere of which is heated by constantly burning fires, the effects of the high temperature being enhanced by copious drafts of warm rice water. During this in-

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terval a bullock or buffalo is confined and fed *ad libitum* on chopped straw flavored with salt, but is denied water. At the close of the third day the patient is made to ride the animal astride, his feet fastened under the animal's abdomen by cords around the ankles. The animal is then led to water, where he drinks so inordinately "that his belly swells to about double its former size." The stress thus placed on the dislocated limb either "brings the wandering bone back to its socket, or produces more serious results likely to render the victim a helpless cripple for life."

In reducing a dislocated shoulder joint, the corresponding hand is firmly fixed to the opposite shoulder by cords around the wrist. Between the elbow and chest is placed an empty goatskin water bag which is gradually filled. The slowly increasing weight (100 pounds or more) overcomes muscular resistance and either "betterment or further injury results."

For reduction of ankle joint dislocation, the injured extremity is placed in a hole dug in the ground and covered with earth firmly packed. The limb is then forcibly pulled outward, "with a fair chance of the joint returning to its normal position."

Shortly after the beginning of the Christian era, Celsus recommended active and passive gymnastics and rubbing of the body before and after exercise. About two generations afterward, Ephesius described the deformities which Glisson later designated as "rickets," and criticized the prevailing methods of treating young children in Italy.

Galen made careful investigations of various deformities, and introduced the terms *kyphosis*, *lordosis* and *scoliosis*, thus leaving his mark on orthopedic nomenclature.

Aurelianus, in the second century A. D., advocated passive movement and splints in the treatment of paralysis. Antyllus, a hundred years later, is noteworthy because of his advocacy of tenotomy in the treatment of ankylosis and contracted joints.

That Avicenna and others of his period (1000 A. D.) were astute observers and learned physicians is illustrated by the fact that they knew and practiced the method of treating spinal deformities by forcible reduction, extension, traction, etc., a plan which was soon abandoned only to be reintroduced and earnestly advocated by Calot several hundred years afterward.

It has been frequently reiterated that Ambroise Pare was the father of orthopedics, yet the name "orthopedia" was not invented until nearly two hundred years after the time of Pare. Andre is accredited with coining the term, and first appeared in his treatise published in 1741. As already mentioned,

orthopedia or orthopedics in those days had a very limited meaning.

Deventer, about 1700, wrote a splendid book on spinal deformities and treated such defects at The Hague until his death in 1724. His book represented pioneer work in delineating deformities of the spine, there being nothing comparable to it until the work of Mechaelis which appeared one hundred and fifty years later.

The real founder of systematic orthopedic practice, that is: "the mechanical straightening of the crooked child," appears to have been Venel who, in 1780, established in Switzerland the first orthopedic institute in the world, where he achieved many successful results. He was the author of a monograph on the correction of lateral curvature and torsion of the spine by the use of mechanical devices.

Venel, as might have been expected, soon had many followers: Heine in Wurzburg, Leithof in Lubeck, Humbert in Bar-le-Duc, Blomer and Hammers in Berlin, Pravaz and Guerin in Paris, Werner in Konigsberg, Delpech in Montpellier, Heine in Canstatt, Heine in The Hague, Langaard and Mansa in Copenhagen, Hirsh in Prague, and Roon in St. Petersburg. This list, given by Hoffa, shows the activity displayed by mechanicians at a time when in Great Britain there was nothing approaching an orthopedic institute. Of all the continental institutes, says Hoffa, that of Johann Georg Heine, of Wurzburg, was the most notable. Venel had invented an extension bed and a club foot shoe, but Heine was a veritable mechanical genius. He believed only in mechanical treatment and his success placed the practice of orthopedics in the hands exclusively of instrument makers and mechanicians.

Venel's institute was known as "an infirmary for the reception of those objects who are born with distorted limbs or have by accident acquired that misfortune." Venel was a skilled mechanician and did a tremendous amount of work. His most efficient device was "a machine which he invented to embrace the patients' limbs when in bed and so contrived as to act without disturbing their rest." Ingenious as was his methods, yet he acknowledged that much of his success depended on the "gentle treatment of his patients and on having them continually under his inspection." Thus is emphasized one of the great secrets of success in all orthopedic treatment, and especially if instrumental. It is said that on the admission of a miserable object, Venel made a plaster of Paris mold of the distorted limb in order to demonstrate the changes which later occurred, a plan which is followed today by every orthopedic surgeon who employs corrective mechanical appliances.

Robert Chessher, a contemporary of Venel,

was a most ingenious and successful orthopedic practitioner. For relaxing contracted muscles he employed "fomentation, motion and friction." Spinal distortions were treated by suitable supporting apparatus. It was Chessher who invented the double-incline-plane for the treatment of fracture of the femur. He described this appliance early in the year of 1828.

Delpech was one of the pioneer orthopedic surgeons in France. In May, 1816, he performed for the first time in history a subcutaneous section of the tendo Achilles for the correction of club foot. This operation was twice repeated by Stromeyer in 1821-1822. Delpech was also the first, after Hippocrates, to suggest that spinal caries (Pott's disease) was tuberculous in nature. He erected a large orthopedic hospital at Montpeller.

Liston was a brilliant and successful orthopedic surgeon and introduced many novelties, notably his shoe for club foot and devices for reduction of dislocations.

The father of orthopedics in Germany was Johann Georg Heine. It is said that especial distinction was attained by the entire Heine family, all of whom were expert mechanics, particularly Jacob Heine, who was the first to describe poliomyelitic deformities, and who wrote an important treatise on dislocations. Due credit must be given to Lorenz who introduced the bloodless method of reducing congenital dislocation of the hip by forcible manipulation, to Wolfe the author of an excellent monograph on the pathological transformation of bones, to Hoffa, who introduced an operation for congenital hip dislocation, to Simon and many others for their splendid work on orthopedics in Germany.

In Scotland, MacEwen was notable for his methods of osteotomy for genu valgum, and for the radical cure of hernia.

In Italy the first interest in orthopedics and the care of cripples appears to have been manifested in 1839, when an orthopedic institute was established by Carbonai who planned and managed it according to the principles of orthopedics as then understood. Prior to that undertaking, little or nothing had been done in Italy for these unfortunate individuals beyond their admission to hospitals and asylums for the poor where they were merely fed, or, in cases of rare deformities, treated with negative results. In 1853 several seaside sanitariums and mountain stations were established through the influence of Barellai. Subsequently many similar institutions were established—each province of Italy having its own—where children afflicted with rickets, tuberculosis and bone deformities can be sent. Many of the seaside sanitariums have been converted into hospitals, some having wards where special methods can be employed—sur-

gical, hydrotherapeutic, gymnastic, the application of orthopedic apparatus, etc. Italy also has a number of schools for the education of crippled children.

In his ten books on surgery, Pare has left us descriptions and drawings of appliances for the treatment of deformities. It is stated that the services of the armorer were called in by Pare, Fabricius and others of that period to produce corrective and retentive apparatus. Dr. Little quotes a description of the corslet devised by Pare, which is "made of thin steel, for the correction of a twisted body." "It should be perforated so as not to be too heavy, and padded so that it will not cause excoriation, and the corslet should be often changed; for those who are growing, it must be changed every three months, more or less, as may seem necessary, for otherwise instead of doing good, one would do harm." In Holland, nearly a century later than when Pare wrote, a very similar appliance was in use. Pare also described apparatus for the treatment of deformities of the legs "of which the sufferers are called Vari and Valgi," and for "too weak and slender legs." These were splints made of moulded leather and apparently to be secured with hooks and eyes. "And the sole of the shoe ought to be made higher on the side to which the deformity is inclined to turn, with the object of reversing it to the side which seems necessary."

During the sixteenth and seventeenth centuries, numerous physicians became interested in the study of spinal deformities, among them being Alberti, Vidius, Pineus, Riolanus, and Francis Glisson. The latter in his classical work on rickets, published in 1650, described orthopedic apparatus and recommended massage. He also described the sling, known by his name, for suspension of the head, which has since been plagiarized again and again by later generations of orthopedic surgeons.

According to Hoffa, Minnius, in 1652, was the first since Antyllus to perform "the orthopedic operation of tenotomy." He divided the sternocleidomastoid muscle or tendon for wry-neck. He was followed by Roonhuysen and also by Florian. Just as the tenotomies of Antyllus for contracted joints were abandoned, so also were those of Minnius and his followers. In the absence of antiseptic precautions, the results were probably disastrous, just as in Delpech's tenotomy many years later, the presence of suppuration discouraged repetition of the procedure. "The tenotomy of Lorenz as advised by Thilenius for club foot remained an isolated instance and produced no permanent advance in orthopedic treatment."

In England for centuries the practice of orthopedics was entirely in the hands of so-

called bone setters. The early English surgeons were apparently more interested in military than civil practice, and Vigo, Wiseman, Gale, Bannister, and even Clowes, offer little of interest concerning orthopedics, although the latter adequately described the treatment of a fractured femur with extension by means of towels, but acknowledged that in the end there remained some shortening. He also recommended the use of "sword scabbards as makeshift splints." The first orthopedic hospital in England was established in 1838.

Lowe, a Scotch surgeon, in his book published in 1597, gave a detailed description of the treatment of fractures. He recommended extension by two men with the aid of cords or strong cloth if necessary, and also gave instructions for the applications of bandages. "Our splints that are made of cards, wood or white iron—splints made hollow—the first of which is biggest shall embrace all the under part of the fracture, the other two shall be put on both sides a little space one from another."

John Hunter, one of the greatest surgeons of his time, did much to clarify knowledge concerning orthopedics. He gave Mother Nature the credit for most recoveries. In his earlier years he sustained rupture of his tendo Achilles while dancing. In discussing the two methods of treatment, the extreme equinus position, and right angles dorsiflexion, he stated: "However, it is not necessary to adhere rigidly to either of these modes of treatment, but to adopt a medium between the two, which will be best. The heel may therefore be a little raised during the time of walking only by raising the heel of the shoe. A roller should be passed several times around the calf of the leg and kept constantly applied, as we cannot guard against the involuntary action of muscles; and at night we may apply an apparatus consisting of a leather slipper and sock, with a strap from the heel to be fixed to a belt in order to steady the muscles."

Study of the pathological anatomy of spinal curvature made considerable progress in the eighteenth century, first through the work of Boerhaave and Morgagni, and later through Percival Pott's investigations on spinal caries, the tuberculous nature of which was not recognized, however, until about a hundred years afterward.

When William Cheselden, renowned surgeon and anatomist, became interested in the subject of talipes, he for a moment raised the veil which covered the history of irregular practice—and most orthopedic practice was then irregular. In the fifth edition of his book on human anatomy, published in 1740, he relates some of his experiences with the bone setters treatment of club foot: "Chil-

dren are sometimes born with their feet turned inward, so that the bottom of the foot is upward; in this case the bones of the tarsus, like the vertebrae of the back in crooked persons, are fashioned to the deformity." He frankly admits that the first knowledge he had of a cure of this deformity was from a professed bone setter to whom he referred a patient "not knowing how to cure him myself." This shows how entirely orthopedic practice was neglected by regular surgeons at that time.

The bone setter's method was to hold the foot as nearly in natural position as possible, then apply strips of adhesive plaster. This was repeated as occasion demanded until the foot was restored to normal position, "but not without some imperfection, the bandage wasting the leg and making the top of the foot swell and grow larger."

Some time afterward, having a case of the kind under his care, Cheselden thought of a better bandage which he had learned from another bone setter, who had cured a fracture of his own cubit, when a schoolboy. His plan was, after placing the limb in proper posture, to envelop it in rags dipped in whites of eggs and wheat flour mixed; this, drying, became stiff and maintained the limb in good position. "And I think," says Cheselden, "there is no better way than this in fractures, for it preserves the position of the limb without strict bandages, which is the common cause of mischief in fractures." When he used this method in club foot, the limb was wrapped almost from knee to toes and held in proper position until the bandage became stiff. The treatment was repeated every two weeks.

Nine years afterward Cheselden repeated this description of the albumen and flour bandage and illustrated it with a drawing. This method foreshadowed the use of plaster of Paris by Dieffenbach and by present-day surgeons.

Cheselden also described and illustrated open tenotomy of the sternal portion of the sternomastoid muscle for wry-neck.

The most outstanding figure in orthopedic surgery during the last century is Sir Robert Jones, of England, a nephew of the great Hugh Owen Thomas. Our profession, says Moynihan, has rarely produced a mind so original and so independent as that of Thomas. He was the descendent of many generations of bone setters. His father, an unqualified man, had an immense orthopedic practice drawn not only from that great industrial center, Liverpool, but from all parts of the world; a week rarely passed without bringing him some case of injury, or disease of bone or joint from overseas. Hugh Owen Thomas, like his four younger brothers, help-

ed his father in the surgery, and even after qualification, was in partnership with him for about a year, until the medical act of 1858 enforced a separation. He regarded surgery as an experimental science; he knew little of pathology and appeared to have been either ignorant of, or at least uninterested in, the appearance of diseased or deformed parts as seen during operation or after death. But of the changed appearances and functions of morbid bones or joints, of the means other than open operation to be used to aid nature in its efforts at restoration, no man ever knew so much. In devising new methods, in the invention of new appliances to be used with uncompromising persistence, in his advocacy of rest,—enforced, uninterrupted and prolonged,—he was displaying the endless resources of a fertile and original mind.

To this man Sir Robert Jones was apprenticed in his earlier years. The immense practice of Thomas was the material in which Sir Robert Jones gained experience, acquiring the methods and learning the principles of his uncle. It was not long, however, before the operative practice of modern surgery was added to the large and peculiar store of knowledge which many generations of bone setters had accumulated. Orthopedic surgery with Owen Thomas was sometimes a matter of enforcing rest, sometimes of appropriate manipulations, sometimes of a wise combination of the two. To all this Sir Robert Jones added the practice of the surgical methods which Lister had made possible. As an operator, Sir Robert Jones is among the greatest. His technique is flawless, yet simple, he is well served by a small, specially trained and devoted team, his own movements show the closest familiarity with every detail of the structural and functional anatomy of the part, and are of the highest excellence in craftsmanship.

Shortly after the war started it became evident that a large proportion of the surgical work would come within the domain of orthopedics. At the head of the orthopedic department of the war office, Sir Robert Jones found his destined place. He became the guide, the counsellor, the example to a large number of workers who quickly assimilated his teaching and were able to practice it on a scale hitherto unimaginable. The genius of Owen Thomas, the skill of Sir Robert Jones, found their highest expression in service to our wounded. The methods of these two, previously little known and rarely practiced, now became the heritage and the enjoyment of all who cared to seek acquaintance with them. "In the practice of orthopedic surgery the spirit of Sir Robert Jones will live forever." (Moynihan).

Among the pioneers in the development of

orthopedic surgery in our own country many illustrious names appear. In New York there were: Lewis A. Sayre, Knight, Taylor, Stubbs, Gibney, R. H. Sayre, and a number of others. The elder Sayre was considered the father of orthopedic surgery in the United States, being the first to devote his entire time to this branch of surgery, and the first to apply a plaster jacket. He was one of the founders of Bellevue Hospital College of Medicine, and for many years was professor of orthopedic surgery in that institution. R. H. Sayre naturally followed in his father's footsteps. He was professor of orthopedic surgery in Bellevue College until shortly before his death, which occurred a few months ago. It is said of him that "he was always in the van in the advance of orthopedic surgery." He was an ardent advocate of tendon transplantation for paralytic deformities of the feet many years before that procedure succeeded of adoption in orthopedic practice in this country. Shortly after Nicoladoni (1892) proposed such a procedure, R. H. Sayre successfully transplanted tendons in the paralytic foot. Equally prominent was Virgil P. Gibney. He was a great friend of the younger men, and was very magnanimous giving credit freely to his colleagues for their efforts. He was an untiring worker and accomplished much.

It may be interesting to note, in this connection that Kentucky has furnished four of the most eminent of the New York orthopedic surgeons: Lewis A. Sayre, Virgil P. Gibney, who was for many years professor of orthopedic surgery in the College of Physicians and Surgeons, Russell Hibbs, who is now professor of orthopedic surgery in the same institution, and Charlton Wallace, professor of orthopedic surgery in Cornell University.

John Ridlon is one of the pioneers in orthopedic surgery in the west, and one of the most prominent. He has practiced orthopedic surgery in Chicago for a generation, and enjoys a national reputation.

Robert Loevelt, of Boston, was a distinguished teacher of orthopedic surgery in his time, and did much to clarify existing knowledge concerning the treatment of infantile paralysis.

The outstanding pioneer in the practice of orthopedic surgery in the south, was Ap Morgan Vance, of Louisville. He received his training under Knight and Gibney in the hospital for the ruptured and crippled, New York. He was a veritable mechanical genius and originated several new instruments and orthopedic appliances, among them being the "Vance osteotome" which is still being used.

Thus it may be seen, from consideration of the foregoing, that for many years, even after the establishment of special institutions

in various parts of the world, orthopedic practice remained for the most part in the hands of mechanics and associated instrument makers. Many of the self styled orthopedic practitioners were so-called bone setters and other types of unqualified and uneducated individuals. While it may be quite true that they understood the proper application of mechanical devices in the attempted correction of certain deformities, yet they possessed no definite knowledge of the fundamental principles of the anatomy and pathology of the human skeleton, and were likewise ignorant concerning the therapeutic measures essential to the restoration of functional capacity and cosmetic appearance. Under such circumstances, during the earlier periods, "once a deformity, always a deformity," was probably the general rule.

It must not be forgotten, however, that prior to the advent of the immortal Lister and the dissemination of knowledge of asepsis, certain strictly operative (i. e., cutting) surgical procedures in orthopedic practice were considered too hazardous to be undertaken; and even after Lister's epoch-making pronouncement, surgeons hesitated to invade bones and joints in the attempted eradication of disease and the correction of deformity. A state of affairs thus presented which required an appropriate remedy, that the greatest amount of benefit might accrue to the largest number of crippled and disabled. The remedy suggested,—and which has now been applied,—was special education and training of orthopedic surgeons in hospitals and teaching institutions. The results accomplished under the revised scheme of education and training have far exceeded the fondest hopes of the most sanguine.

The most outstanding advances in the evolution of orthopedic surgery have been made during the last half century. These achievements have revolutionized orthopedic surgery, and finally not only established it as an important specialty but also placed it upon a firm and permanent basis.

During this evolutionary period many of the older methods and appliances have been discarded, others have been modernized and retained. New methods and devices have been devised and perfected.

It is interesting to observe that the fear of disastrous results from surgically invading bones and joints has practically disappeared. There no longer exist any *noli me tangere* areas in the human osseous system and its tendinous attachments. Orthopedic surgical procedures of which our forefathers never even dreamed, are now being successfully executed. Diseases and defects of bones and joints entailing disability from functional impairment are surgically treated with

satisfactory outcome.

While it would hardly be appropriate in this address to enumerate and describe in detail the later orthopedic achievements, we may mention the manifold benefits that have accrued to humanity, in the relief of pain, suffering and disability, from the newer methods of treating the sequelae of infantile paralysis, scoliosis, spinal caries, diseased and painful joints, fractures, etc. The newer methods, devised and perfected by the persistent labors of modern orthopedic surgeons, are now in common use.

The treatment of all varieties of fractures has now been practically placed within the domain of the orthopedic surgeon. Under the revised plan of education and training, the orthopedic surgeon has acquired a better understanding of the methods which are most successful in the management of fracture cases. This fact has been recognized by many of the teaching institutions, including the Massachusetts General Hospital, Washington University, the University of Michigan, the Mayo Clinic, etc.

While the proper reduction of a fracture is always essential, the after-treatment is equally important to accomplish restoration of function without pain. Especial care is required in the treatment of these cases, and the orthopedic surgeon is familiar with the methods by which the best ultimate results are secured, such as physiotherapy, massage, passive and active motion, etc.

The organized agencies for care of the crippled in our country are so numerous and so active that large numbers of cases have become available for clinical and teaching purposes. This command of material has done much to increase the experience and enhance the skill of orthopedic surgeons. A few years ago orthopedic surgery was confined to the larger cities. "Now orthopedics as a specialty is practiced throughout the land. Both coasts and the interior of our country are richly supplied with orthopedic clinics, many of which have a well-deserved international reputation."

Of necessity, in preparing the foregoing address, many of the data were copied or abstracted from the writings of others to whom it is desired full credit be extended, with thanks for the privilege exercised in reproducing the material. The appended list of references shows the names of the authors and publishers to whom I am especially indebted.

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ORIGINAL ARTICLES

SYMPOSIUM ON SCARLET FEVER

ETIOLOGY AND SYMPTOMATOLOGY OF SCARLET FEVER*

By T. J. MARSHALL, Paducah.

The past few years have witnessed many new developments for the comforts of mankind and for the prolongation of life; among such, few if any, are surpassed by those which have resulted from the study and practice of pediatrics. The so-called communicable diseases have received a great deal of attention and as a consequence the methods of diagnosis and treatment have in some respects been almost revolutionized. The advances and study of Scarlet Fever stand out preeminently.

Scarlet Fever has doubtless existed from time immemorial, but up to about the year 1676, when Sydenham applied the term Scarlet Fever, it had been grouped with measles and diphtheria as one disease. It has however, since that time, been recognized as a definite clinical entity.

Children are much more susceptible to the infection than are adults, still there are a large number of children who have a natural immunity to the disease; children under one year of age seldom contract the disease, the percentage for this age being somewhat over 1%, with the incidence rapidly rising up to three years where it remains level for about five years, then falling gradually until at the age of fifteen, it again attacks 1% of the population.

Epidemics are more frequent during the winter and spring months when upper respiratory infections are more common and children are kept in and congregated in poorly ventilated houses, especially in schools.

Scarlet Fever is more common in the white race than it is in the colored. Dublin, from the Metropolitan Life Insurance Co. statistics, found that the death rate among the colored race was about one-fourth that of the white.

From clinical experience, and our knowledge of bacteriology, it is known that the infecting agent is present in the secretions from the respiratory tract, discharges from the middle ear, mastoid, and suppurating glands and not the desquamated scales of the skin. The infection may be carried in food, espe-

cially milk; and toys, books, beddings, etc., when contaminated by discharges of infected persons, may be responsible for the spread of the disease. The house fly and other insects may carry the disease to susceptible persons. It is difficult to destroy the infecting agent, and the tenacity of the virulence makes it capable of living a long time under favorable conditions, but, as drying rapidly destroys the bacteria, there is no reason to believe that the infection is air borne and the transmission by a third unaffected person is doubtful; on the other hand it appears that close contact with the patient or with healthy carriers is the most frequent mode of the spread of the infection.

The bacteriology of Scarlet Fever has long interested investigators and the profession has long been impressed by the prominence of the streptococcus found present in the throat and complicating inflammatory areas and at times in the blood, but which was thought until recently to be a secondary invader, and not the specific cause. It remained for the Doctors Dick and Dick to demonstrate its actual role in scarlet fever, and to prove that the disease is caused by a specific streptococcus of the hemolytic type.

It is interesting and instructive to review the study of this disease, especially since 1884 when Loeffler isolated the streptococcus from throat smears of angiose cases, but time is limited and it seems to me for a paper of this kind it is sufficient to state that there are certain predisposing causes and that the disease is caused by a specific organism.

Symptoms: Scarlet Fever probably presents more variations in its manifestations than any of the eruptive fevers, therefore, at times the diagnosis is extremely difficult.

Morse states that it is very difficult to describe the symptomatology of scarlet fever, because of the great variability in the severity of the disease. It may be most malignant in its onset and symptomatology, with death in twenty-four hours or less. Death may occur even before the appearance of the rash. On the other hand, it may be so mild that it is extremely difficult to know whether the disease is really scarlet fever or not. Kerley states that nearly all the characteristics of the disease are subject to wide variations. Even the rash, the most constant symptom, may be simulated by sepsis or produced by drugs. Among the diseases of children which we are called upon to treat there is, furthermore, no other which may present itself in such unusual and peculiar ways. Morse further states there is no doubt that scarlet fever is, on the whole, much milder in type now than it was 30 years ago. Judging from the description of the disease in the older text

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books, it was milder then (30 years ago) than it was one hundred years ago.

The incubation period is short, usually two to eight days. The prodromal stage is also short and apt to be overlooked in children, the first symptom noted may be the unexplained attack of vomiting, chilliness or rigor may be present, there may be loss of appetite, the child may be irritable and complain of headache and muscular soreness, if old enough, while convulsions in young children are not uncommon.

The symptoms of a typical case of scarlet fever will be sudden onset, sore throat and vomiting, fast pulse and a rapid rise in temperature, early appearance of an erythematous rash, enlargement of the cervical lymph nodes and a peculiar appearance of the tongue. Woody states that the combination of intense angina and initial vomiting is so constant a feature of the disease that even in the absence of the exanthema it immediately suggests scarlet fever.

The mucous membrane of the mouth, the pharynx and the nasopharynx show a diffusive fiery red eruption; the tonsils are the site of great intensity of the exanthema, they are markedly reddened and swollen and often covered with a well organized pseudo-membrane which may be indistinguishable, clinically, from diphtheria. There is often a profuse nasal discharge. The palate is reddened and is of a punctate appearance. The tongue is at first covered with a white coat which begins to desquamate in a day or two, leaving it red and glistening with the papillae prominent, this strawberry or raspberry appearance of the tongue may persist for several days, gradually resuming its normal appearance.

The submaxillary glands are usually enlarged, hard and painful, sometimes the post cervical and generally the inguinal glands are involved.

The temperature rises rapidly, usually attaining its maximum in about twenty-four hours remaining two or three days or as long as the eruption continues bright and then falls by lyses. The temperature furnishes a fairly accurate index to the severity of the attack. The mild cases show little fever, while the severe ones almost always exhibit high temperature. Thus a temperature of 103 to 105 will usually be accompanied by a well marked rash and severe prostration, which tell us that the poisoning is severe. When the temperature remains above 103 the child is very uncomfortable and complains of itching.

The pulse is small, rapid, out of proportion to the fever and is usually tense. The rash is described as bright red spots between which normal skin may be visible at first. By the increase in the rash and in the brightness of

the individual macules, a more or less confluent exanthema is produced within two or three days. After this period it may be difficult to recognize the individual lesions of the rash except on the inner surfaces of the thighs or on the forearms. The skin feels puffy and like velvet. After the rash has persisted for a few days the skin under pressure has a distinctly yellow color. As a rule the eruption begins on the neck or chest and spreads to the entire surface of the body within 24 or 48 hours, the cheeks are red and the nose and area around the mouth and chin are white and stand out against the bright red background.

Firm pressure with the open hand or fingers will often show white lines that quickly disappear, but reappear with greater distinctness and remain visible for a longer time. Stroking the skin with the finger nail will show either a white or a red line with a well marked line of pallor on either side.

In mild cases the rash is often evanescent and not infrequently is altogether absent in certain parts of the body. It sometimes begins to fade from the earlier affected parts before it has spread to later involved areas, as the extremities for instance. In some cases, especially where the throat symptoms are pronounced, and in malignant cases the rash may fail to develop.

The eruption remains at its height from two to six days. With the subsidence of the rash the temperature falls gradually to normal. Coincident with the fading of the rash desquamation usually begins and often desquamation establishes the diagnosis. The process of desquamation usually extends over a period of two or three weeks or longer. There may be considerable variation in the character of the desquamation, it may be almost imperceptible, or it may be present in the form of a powder which rubs off as the skin is being dried after a bath. It may be found only on the neck or about the fingers and toes, or as a little roughness on the shins. As a rule however, it is more definite and can be easily seen and felt. Casts from the fingers and toes have often been observed. The soles and palms are the last parts of the body to clear up. Woody thinks that finger desquamation is pathognomonic of scarlet fever. He says, "There is noticed at first a thickened, parchment like feel of the ball of the fingers accompanied or soon followed by a white line at the juncture of the pulp of the finger with the nail. The skin along this line may be separated with the examiner's finger nail and made to peel backward, coming off very easily in large strips or casts."

The urine is dark and scanty. Albumin is usually present during the height of the fever. The Diazo reaction is usually positive in septic

cases during the stage of eruption, and is sometimes regarded as a forerunner of a stormy course of the disease.

The blood in scarlet fever shows a marked leukocytosis. The increase is supposed to begin during the incubation period and to progress with the disease, ranging in mild cases from 10,000 to 34,000 and in severe cases from 14,000 to 40,000. The differential count shows mainly an increase in the polymorphonuclears. Eosinophils, which are at first diminished, also increase toward the third and fourth days, a phenomenon which seems to be peculiar to scarlet fever, and which might serve in differentiating it from tonsillitis or other septic infections.

Summary: Scarlet fever is an acute contagious, self limited disease caused by a specific strain of the hemolytic streptococcus, one attack usually protecting the individual through life. The period of incubation is usually from two to eight days, that of invasion from 12 to 24 hours, that of eruption from 4 to 6 days, and that of desquamation from three to six weeks. It is usually ushered in by vomiting, fever, sore throat, and is characterized by an erythematous rash appearing first upon the neck and spreading rapidly over the entire body, followed by skin desquamation. The disease may be communicated until all purulent discharges have subsided.

Future of Children with Mongolian Idiocy.—

Spuhler followed up sixty-eight children with mongolian idiocy, some of them since 1912. Forty-four per cent of the children died, almost all before the age of 6 years (50 per cent from pneumonia and 20 per cent from congenital heart disease). Of forty-eight patients who are still alive, 52 per cent are aged more than 10, and 10 per cent more than 20. Seventeen of them are in asylums, where they are not able to do even the simplest work to pay a part of their expenses. The mongolian characteristics and the muscular hypotonia diminished with age, but the retardation of the growth of the body and of the sexual development and the tendency to obesity became more accentuated. Their activities decreased more and more, they became apathetic, and their intellect never developed much: usually they could count up to ten, and only one patient, aged 18 years, could count up to 100. Only one patient, also aged 18 years, could read whole phrases slowly; some could read single words, and the rest of them could recognize only separate letters.

THE DIAGNOSIS AND TREATMENT OF SCARLET FEVER*

By CHAS. MILES MCKINLAY, M. D., Lexington.

Scarlet Fever is an acute communicable disease characterized by sudden onset, sore throat, fever and in the vast majority of cases by an erythematous eruption appearing as a rule within forty-eight hours of the beginning of the symptoms. That it is caused by a definite organism is unquestionable. That this organism is an haemolytic streptococcus of the "B" group is most probable. In fact Dick and Dick claim to have isolated an haemolytic streptococcus (*Streptococcus Scarlatinae*) which is capable of producing the disease in human beings on inoculation and which differs from other haemolytic streptococcus strains. Other investigators doubt the definiteness of this organism, especially Italian investigators.

The epidemiological importance of the disease has spurred investigators for many years and a vast amount of work has been done. Wonderful progress has been made, particularly in the last ten years. Our conception of the disease is changing, our diagnostic aids are increasing and our treatment both as regards prophylaxis and cure bids fair to be markedly improved.

Diagnosis of a typical case of scarlet fever is rarely difficult. A sudden attack of vomiting, accompanied by a sore throat, marked acceleration of the pulse, rapidly rising temperature and a heavily coated tongue should make us more than suspicious. The appearance of an erythematous rash within thirty-six to forty-eight hours makes our diagnosis almost certain.

Unfortunately there are so many atypical cases and certain other conditions so closely resemble scarlet fever that a positive diagnosis is often difficult and at times impossible, particularly in the early days of the disease. Let us briefly consider some of the most important characteristics of our symptom complex.

ONSET

The onset is abrupt. Prodromal symptoms are usually overlooked except when anticipating an attack. The incubation period is short practically all cases appearing in the first week following exposure. Eight to ten days is considered the limit of liability of attack.

Vomiting is by far the commonest symptom. It appears without obvious cause, persists, apparently unaffected by treatment, for twenty-four to thirty-six hours and then stops except in the more toxic cases.

Convulsions in infants and young children

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are not uncommon.

Throat involvement is constant, early in appearance and necessary for diagnosis. Examination shows extensive redness of the uvula, pharynx and tonsils. The posterior one-third of the hard palate shows an erythematous flush with bright red points scattered through it. There may or may not be subjective symptoms of sore throat and there seems to be very little connection between the severity of the involvement and the amount of pain.

TONGUE

Early in the disease the tongue is heavily coated. Progressive changes occur which are of diagnostic importance. A marginal break occurs and desquamation begins leaving a greyish white center pierced with red swollen papillae. Day by day desquamation proceeds from the margins towards this central-coated area until by the fifth or sixth day, the typical "Strawberry" tongue, brilliant red with swollen papillae, is present. From this stage there is a gradual subsidence to normal.

THE ERUPTION

The eruption usually appears within the first thirty-six hours. It may appear earlier or later. It begins on the sides and front of the neck and spreads downward. It is apt to be most marked in the axillae, the groins, the inner side of the thighs, the back and the abdomen. If the face is involved the forehead and nose are rash covered, the cheeks flushed and the rash free area about the mouth very white, giving the characteristic "circumoral pallor." A rather consistent diagnostic sign is the appearance in the antecubital fossae of several lines of eruption. This is designated as "Pastia's Sign."

The eruption has been described as "a pinpoint eruption on a sub-cuticular flush." It is extremely variable in time of appearance, distribution and extent. When present however, it lasts from two to five days beginning to fade first on the neck and chest.

Desquamation begins usually about the second week with fine scales appearing on the sides of the neck, the ears and over the chest and back. The extent of desquamation depends greatly on the severity of the disease and the eruptive involvement. There has been much controversy as to whether or not all cases of scarlet fever desquamate. In view of the present opinion that about twenty per cent of all scarlet fever patients have no rash and as desquamation is the end result of actual skin death from an acute dermatitis it would appear that desquamation is not universally present.

TEMPERATURE

The temperature rises rapidly from the onset reaching its peak in about thirty-six hours. This is usually coincident with the

height of the eruption. It continues high with slight remissions until fading of the rash begins when it falls by lysis reaching normal in seven to ten days. Variations in this order are suggestive of complications—mild cases are practically afebrile. The pulse rate is accelerated out of all proportion to the temperature.

URINE

During the febrile stage, the urine is scanty, high colored with albumin and a few casts almost universally present. The blood shows a polymorphonuclear leucocytosis of from 15,000-30,000.

DIFFERENTIAL DIAGNOSIS

The differentiation of the mild and atypical cases of scarlet fever is very frequently a problem which calls upon the physician for every bit of ability, diagnostic aid, patience and tact which he possesses. The parents are naturally anxious and want an immediate decision. So much anxiety and inconvenience can be caused by a faulty diagnosis that it is imperative that extreme care be exercised.

In 1924, Dick and Dick devised a skin test for scarlet fever which is of the greatest value in determining susceptibility to the disease and as a diagnostic aid. It has made possible accurate checking up on active immunization. The test consists in the intradermal injection of 1cc of a diluted soluble toxic filtrate. The test is controlled by a similar injection of boiled toxin. A positive reaction consists of a redness of the skin two to three centimeters in diameter accompanied by slight swelling. It should be read at the end of twenty four and forty-eight hours. Positive reactions are usually followed by pigmentation at the site of injection after 5 to 10 days. The test is, for the greater part, accurate. Variations in skin sensitivity cause some confusion. Most of the confusion is due however to inability to interpret our findings correctly rather than to inaccuracy of the test.

The test is positive in the early days of the disease and disappears by the end of the first week usually. Any suspected case showing a negative Dick test in the first two days is probably not scarlet fever. Any case showing a positive reaction after two or more weeks probably did not have scarlet fever.

Some years earlier Schultz and Charlton described a test known most commonly as the "Skin blanching" test. This test consists in the intradermal injection of $\frac{1}{2}$ -1cc of serum of a patient convalescent from scarlet fever. The serum is injected in an area where the suspected rash is most prevalent. In cases of scarlet fever, a white area appears around the site of injection and persists for a variable time, frequently until the rash fades. The reaction is best seen by placing the patient in a good light and standing at some distance.

When positive it is of great value as the blanching does not occur in rashes other than scarlet fever. A negative reaction however is not proof positive that we are not dealing with scarlet fever.

These two tests taken in conjunction with our other findings are very valuable adjuncts.

Measles should present few difficulties. The predominating catarrhal symptoms, the presence of Koplik's spots, the later appearance of the rash and its macular, blotchy character are quite different. The appearance on the mucous membrane of the cheeks and hard palate of raised irregular spots varying in size from pin-points to areas as large as a pea is very suggestive of measles. The tongue may be coated early but does not desquamate as does the scarlet fever tongue. A Leucopenia is characteristic of measles though there may be an early leucocytosis.

RUBELLA

In German measles the mild, slow onset of the disease with the early involvement of the lymph nodes especially the posterior cervical chain, the absence of vomiting, heavily coated tongue and leucocytosis practically rules out scarlet fever. The rash may be suggestive but the other signs and symptoms are too characteristic. After all, the rash of scarlet fever is only a symptom and should be regarded as such. To rely on the rash alone to diagnose any of the exanthemata is to fail in many a diagnosis.

Diphtheria may be difficult to differentiate from scarlet fever particularly when accompanied by a rash. The diphtheritic eruption is usually transient. The tongue in diphtheria has not the characteristic furring and the temperature is, as a rule, not as elevated. Throat culture is probably our most dependable means of early differentiation. This is of the greatest importance in all cases, even frank cases of scarlet fever, as the two diseases are frequently coexistent. Acute tonsillitis appearing during a scarlet fever epidemic may be very difficult to differentiate. From recent research work it appears almost certain that many such cases are scarlet fever without the rash symptom. When such tonsillitis cases have a rash our difficulty increases. A negative Dick test early in the disease would rule out scarlet fever.

ERYTHEMA SCARLATINIFORM

The various and assorted erythemas that occur in children are often very puzzling, etc., particularly Erythema Scarlatiniform eruption simulates scarlet fever very closely but the other symptoms are mild and there is generally a definite digestive upset. There is early and extensive desquamation. These transient erythematous rashes are not as generalized as the scarlet eruption and have a rather characteristic rough feeling to the

hand. In these cases the skin blanching test is extremely helpful.

ERYTHEMA INFECTIONOSUM

Under this head can probably be grouped those diseases variously known as Duke's Disease, Fourth Disease, Roseola infantum etc. The condition, particularly the first one or two cases seen, is puzzling. It is characterized by a mild invasion with fever, chills or chilliness, slight sore throats and coated tongues.

The rash appears suddenly after the child is apparently convalescent. It is macular, somewhat bluish red in color, fades on pressure and does not itch. The centre of the macule fades early leaving an irregular periphery somewhat like the lesions of pityriasis rosea with out the wrinkled centre. The blood shows a leucopenia with a polymorphonuclear diminution that is quite characteristic.

DRUG ERUPTIONS

The history of ingestion or rash producing drugs, the appearance of the rash, its distribution and absence of other symptoms will usually make the diagnosis clear.

Very recently extensive work has been done in culturing throats of scarlet fever contacts and suspects. The results obtained were sufficiently conclusive to indicate that the taking of throat cultures in scarlet fever suspects is an extremely valuable diagnostic procedure. Unfortunately this is not at present practicable for the average case, though it seems safe to predict that in a few years at least such a procedure will undoubtedly be considered a routine measure.

TREATMENT

The responsibility of the physician treating a case of scarlet fever does not end with the treatment of the patient. It is his duty to insist on isolation and quarantine. He must take measures to prevent the spread of the disease and try to the best of his ability to protect those already in contact.

Prevention of the spread of the disease and protection of contacts has been materially augmented by the Dick Test. Contacts should be tested at once. Those negative after forty-eight hours, may be released from observation and allowed to go free after thorough bathing, clean clothes, etc., provided they leave the house and avoid further contact. Those showing a positive Dick Test should have active immunization started at once. A large initial dose (500-1000 S. T. D.) followed by two or more doses at five to seven day intervals is the method of choice. The second dose may be 2-5000 S. T. D. The third 10-20,000 S. T. D. etc. Immunity begins at once and is assured after several weeks lasting for a variable time, at least eighteen months. Consensus of opinion is that short cut methods us-

ing ricinoleated toxin etc., are not effective.

School children, teachers and food handlers showing a positive Dick Test should be kept under daily observation for eight to ten days. If no symptoms develop in that time they may be allowed to return to their work, providing they live apart from the patient.

Passive immunization by the the injection of scarlet fever antitoxin, is in my opinion to be decried. The immunity is only temporary and the reactions are in most cases extremely violent.

The question of the length of quarantine is an open one. The usual Board of Health requirement is thirty days. Recent literature has been full of articles advocating various periods from eight weeks to no quarantine at all. There seems to be no evidence that the use of antitoxin sera shortens the period of infectivity whereas improvement of cultural methods would indicate that a longer period of isolation than the standard thirty days is necessary to render scarlet fever patients safe. Especially patients with infective discharges.

GENERAL TREATMENT

In the past fifteen or twenty years scarlet fever has been in the main rather mild. Whatever the cause of this the effect has been an increasing laxity in our attitude toward it which must be protested against. The antiseptic soaked sheet may have been a magnificent gesture but it was at least a very potent reminder that trouble lay beyond.

The patient and his nurse should be isolated from the rest of the household in a light, well ventilated room furnished with necessities only. Dishes and utensils for those in isolation should be kept separate and soaked in an antiseptic solution before being allowed to leave the sick room. Bedclothing, towels, etc., should be similarly treated. The physician in attendance should wear a gown and a cap and should wash his hands thoroughly before leaving the premises.

For the patient, rest in bed is to be insisted on in all cases, ten days in the mild cases and several weeks in the severer ones in order to lessen the danger of post-scarlatinal nephritis. Routine health habits, bath etc., should not be interfered with, care being taken to avoid chilling during the bath. The use of carbolated vaseline or some similar preparation to allay the itching is often of comfort to the patient.

Diet should be liquid during the febrile stage avoiding however the use of broths and nitrogenous foods. After defervescence, cereals, cream, soups, stewed fruits, etc., may be added, gradually increasing the dietary. Meat eggs, meat soups and fish should be omitted for five or six weeks.

This seems drastic to many patients but the kidneys must be spared in so far as is possible even in the mildest cases.

The temperature requires no treatment as a rule. If necessary it may be reduced by tepid sponges, alcohol rubs and an ice cap to the head. Aspirin and phenacetin either alone or in combination with small doses of Dover's powder are useful both to lower the temperature and quiet the restlessness.

Cardiac symptoms, cyanosis, cold extremities and a weak irregular over-active heart require stimulation. Digitalis over a period of several days; Caffeine, Sodium Benzoate or camphorated oil for immediate results are useful. In extreme collapse adrenalin hypodermatically is invaluable.

Mild sore throat requires little or no treatment. The severer forms are materially benefited by swabbing with one half peroxide followed by 2% mercurochrome, or a solution of mercurochrome in acetone alcohol, and the external application of ice. Douching the nose and throat with normal saline is very beneficial when it can be done correctly. In many, if not most instances nasal douching is difficult and with a frightened child and poor help, there is danger of forcing infection into the middle ear. A few drops of a solution of Ephedrine Sulphate in 5% Neo-Silvol or one half percent Protargol will keep the nose open and accomplish approximately the same result.

Daily inspection of the ears is of paramount importance. Too often this is neglected and the first indication of an Otitis is a discharging ear. Children frequently cannot localize pain and there may be no noticeable rise in temperature to indicate aural involvement. Early paracentesis is imperative and vigilant after care necessary. Mastoid involvement demands prompt surgical intervention.

The swollen painful glands of scarlet fever are probably best treated by external cold applications, ice preferably. I have seen very little benefit from the various salves, pastes and ointments commonly used. Where available, the use of the ultra violet ray is of considerable value. When suppuration occurs incision should be delayed until the gland has completely broken down. This allows for complete emptying through a small incision and avoids the long drainage and disfiguring scars of too early incision. Cellulitis requires early and thorough incising without waiting for pus formation. The urine should be examined every second or third day for several weeks. The albuminuria of the febrile stage requires no treatment except plenty of water. If this persists however, and the urine becomes scanty with increase in albumin and casts, active measures must be started. Alkaline diuretics may be given—Potassii or Sodii Citrate, Alkaline waters etc. Saline laxatives and hot baths or packs to further elimination are indicated.

Fluid intake and output should be measured and the tendency to uremia combated strenuously. When the oedema is marked, a salt free diet and restricted fluids are indicated. Uremia is to be treated as in any other condition. Coma and convulsions are often relieved by trepanation and lumbar puncture. Chloroform may be necessary but is best avoided. Morphine Sulphate hypodermically is of the greatest value.

The anaemia resulting from such attacks requires iron in large doses for a long period. In children, Basham's mixture is extensively used. Iron Cacodylate or citrate may be given intravenously or subcutaneously. The arsenic in the former preparation may cause trouble and is to be used cautiously.

SPECIFIC TREATMENT

Active immunization against scarlet fever has been made possible by the Dicks. It is analogous in its technic to the use of toxin-antitoxin in diphtheria. The injections are given at five to seven day intervals. Three or five doses are given beginning with 500 S. T. D. and increasing each dose materially. The three dose method with large doses is rapidly gaining favor.

There may be considerable general reaction following these injections, with a rash, high temperature etc. Better supervision and control of the supply of toxin has resulted in fewer severe reactions. The immunity conferred lasts a variable time, at least one and a half years perhaps longer. At end of that time it is advisable to re-test and repeat if necessary.

In 1926 Larson advocated the use of toxin detoxified with Sodium ricinoleate. This makes possible the giving of sufficient toxin in a single dose to render Dick positive children—Dick negative in one to three weeks.

His findings have not been verified by other investigators and this method is not held to be as effective as the three or five dose method. The question arises—shall we advise the immunization of all Dick positive children as a routine measure? Personally I feel that in the presence of an epidemic or after contact all such children should be immunized. Otherwise I would say not at present.

The treatment of scarlet fever by the use of a specific serum was first advocated in 1902, by Moser, of Vienna, who prepared a polyvalent antitoxin from the blood of horses, who had been injected with streptococci obtained from fatal cases of scarlet fever. About thirty strains were used. His reports were favorable rather than otherwise. Apparently nothing further was done until Dochez in 1923, injected animals subcutaneously with agar cultures of streptococci, subsequently

obtaining a serum. A year later Dick and Dick prepared an antitoxin by chemical precipitation from the blood of horses injected with sterile streptococcus filtrate.

Antitoxin obtained by the Dochez and Dick method is available and has been widely used. It is given either intravenously or intramuscularly. The dosage depending on the size of the child.

The most widely divergent opinions are held regarding its use. It has been my practice to use it in severe cases only, to give it early and in one big dose. So far I have had nothing but brilliant results with it. I have seen the temperature fall from 105 degrees to normal within twenty-four hours and never go up again. I have seen a very profuse eruption disappear in a like time and an adult patient acutely ill and semi-stuporous one day, apparently well and clamoring to be out of bed two days later. I have never had a case of serum sickness following its use in a developed case of scarlet fever although I have had entirely too many follow it when given as passive immunization.

During the preparation of this paper, I was in communication with some physicians and talked to others who have been most active in the research done along this line in recent years. They seem agreed that in many cases the results are most beneficial but other cases fail to show any improvement. It seems to be the consensus of opinion that antitoxin has little or no effect in preventing complications except that benefitted cases might have developed complications had the disease progressed—That serum sickness following its use may be very unpleasant if not dangerous. That it is best reserved for severe cases.

In view of the possibility of severe reactions it is advisable to give 5cc subcutaneously to desensitize the patient and give the larger dose several hours later.

In all the larger medical centres, both in this country and in Europe, the work is going on steadily and each day new light is being shed on the problem.

I believe it safe to prophecy that before many years we will be able to immunize against and treat scarlet fever as capably as we now can diphtheria, although the problem is a far greater one.

Comparison of Nutritive Values of Food Prepared with Raw Milk and with Milk Subjected to Long Heating.—Scheumert and Wagner did not observe and deleterious effect from long continued cooking or heating on the nutritive value of foods prepared with milk in their studies on the growth of rats. This is exactly the opposite of what Friedberg reported.

EAR COMPLICATIONS IN SCARLET FEVER*

By J. R. PEABODY, Louisville.

Mr. President, Members and Guests of the Kentucky State Medical Society: Please allow me to make a few remarks of explanation concerning my paper on Ear Complications in Scarlet Fever. An Ear, Nose and Throat man from another Kentucky city was scheduled to read the paper on this subject but he notified the program committee a short time ago that he would not be able to take part in this symposium; therefore I was invited to take his place.

I apologize for seemingly stepping out of bounds to discuss the use of scarlet fever antitoxin but in my opinion, the most important fact for us to know about scarlatinal otitis is how to prevent its occurrence. In preparing this paper, I have tried to find out whether or not the use of it has prevented ear complications and have quoted from several recent articles on this subject.

For over a half century the medical profession, also the average layman, especially the parents of little children, have known that scarlet fever is sometimes followed by disastrous ear trouble; and in the present era of preventive medicine, laboratory workers and health officers have been diligently at work striving to stamp out this disease by immunizing susceptible individuals with a scarlet fever toxin and by the enforcement of quarantine regulations; also pediatricians and otologists have endeavored to adopt a method of treatment which will either prevent the occurrence of ear complications or will lessen the seriousness of these ear conditions when they do occur in scarlet fever.

As the result of this work and partly because the human race has been gradually developing an immunity against this disease, it is common knowledge that, proportionately to the increase of population, the number of scarlet fever cases have diminished, the virulence and mortality are not so great, complications have been less frequent; but we still have epidemics of this disease and Otologists are called upon to treat inflammations of the ear varying in intensity from a simple acute otitis media to a severe mastoiditis with lateral sinus thrombosis, brain abscess, labyrinthitis, or even a fatal meningitis.

Referring to some of the older text books written in the year 1913; the mortality of scarlet fever was given at ten per cent, the occurrence of middle ear complications was reported from ten to twenty per cent, with mastoid involvement in one per cent. It was

also stated at this time that scarlet fever causes more cases of deafness and deaf-mutism than any other disease of childhood; over ten per cent being due to this cause. Statistics on this subject in the recent journals, even before the use of antitoxin, show the mortality less than two per cent, the occurrence of otitis from eight to twelve per cent, with mastoiditis still about one per cent. These figures indicate that in the past twenty-five years there has been a decided reduction in the mortality and some reduction in the number of ear complications; but we cannot come to any definite conclusions on these figures because scarlet fever epidemics like other infectious diseases, especially influenza, vary in severity and in the type of complications produced by them. Some epidemics are very mild while others are of a very malignant type which may give rise to severe tympanic and mastoid suppurations.

It is now fairly well established that scarlet fever like diphtheria is a local infection of the mucous membrane of the nasal pharynx and that the bacterial incitant is the streptococcus hemolyticus. But it still remains uncertain as to whether there is a specific type of streptococcus hemolyticus described by some laboratory workers as the streptococcus scarlatinae which they claim not only produces the characteristic toxic phenomena of scarlet fever but also at times the septic complications in an individual who shows either a high or a low resistance to this organism.

It is not within the scope of this paper to discuss at length the therapeutic value of scarlet fever antitoxin but from my limited experience and rather extensive reading of the latest medical journals, I am not convinced that its use has materially reduced the mortality nor the occurrence of ear complications and I am still of the opinion that we should carefully weigh the benefits which may be secured against the harm which may result from such treatment.

Dr. F. G. Blake, in his article on scarlet fever in the Billing-Forcheimer Therapeutics of Internal Diseases, recommends the use of antitoxin and states that "In order to interpret satisfactorily the therapeutic effect of scarlet fever antitoxin it is necessary to keep in mind that one must distinguish between its effect on the specific toxic phenomena of scarlet fever on the one hand and its effect on the septic aspects of the disease on the other, since the two processes are of a distinctly different nature. It has been shown by Blake and Trask, Park, Friedemann and many others that antitoxin in proper amount is a specific and prompt cure for the essential toxic phase of scarlet fever but that it benefits the pyogenic aspects of infection with streptococcus scarlatinae only indirectly and

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only during the early toxic or exanthematous stage, presumably by curing the specific toxemia and thereby placing the patient in a position to overcome more readily the pyogenic complications. It is consequently important to remember that its efficacy depends upon the administration of a sufficient dose, as early as possible, before the septic aspects of the infection have assumed a dominant role."

Doctors Toomey and Dolch, of Cleveland, in the December, 1928 American Journal of Diseases of Children, on "The Use of Scarlet Fever Antitoxin," conclude their article with the following statement: "The sickness following the use of serum is extremely severe; in fact, it is usually more severe than the disease itself and we believe that at the present time the evidence in favor of the use of scarlet fever antitoxin is neither clear cut nor decisive."

Dr. James W. Bruce, of Louisville, in an article in the Kentucky State Medical Journal January, 1928, stated that: "There is a quite general agreement as to the efficiency of scarlet fever antitoxin. I do not believe, however, that it should be given to every patient with scarlet fever. The serum sickness which usually follows from its administration is worse than a mild case of scarlet fever. If serum is given, it should be given immediately as soon as the diagnosis is made, in full therapeutic dose. Complications are somewhat less likely to occur after antitoxin, but they frequently do occur. Those who expect to avoid complications by giving antitoxin will be disappointed."

Doctors James A. Pritchett and F. L. Fletcher, of Louisville, in their article on "Serum Treatment of Scarlet Fever," in the August, 1929 Kentucky Medical Journal analyzed one hundred and thirty-six cases at the Louisville City Hospital and made this comment: "Statements as to the effect of serum on the development of complications vary but they were not reduced in this series of cases. Without question a severe serum reaction causes the patient much more discomfort than a mild case of scarlet fever."

With all of this uncertainty and debate over the efficacy of scarlet fever antitoxin even the most enthusiastic advocates of its use will admit that we still have complications to treat and that the most common complication of scarlet fever is otitis media; the frequency of its occurrence depending largely on the virulence of the prevailing epidemic, on the age and resistance of the patient, to some extent on the amount of throat involvement, and also on the method of treatment.

The ear affections seldom occur before or during the rash but generally during the desquamation period although they have been

reported as early as the fourth day and as late as the fortieth day. In measles, middle ear and mastoid symptoms occur during the height of the active process whereas in scarlet fever, middle ear involvement and mastoid complications may appear at any time during the course of the disease.

It has long been recognized that the earliest manifestations of scarlet fever is in the throat and a sore throat usually precedes the eruption in scarlet fever by twenty-four or forty-eight hours. Not only is the throat affection as a rule the first, but it is the most constant symptom of this disease. The characteristic feature of the scarlatinal sore throat is the bright red injection of the fauces and tonsils, appearing at the same time as the typical "strawberry" tongue. The degree of inflammation of the throat in scarlet fever varies from the slightest congestion of the fauces to a severe septic or gangrenous pharyngitis. The average case shows redness of the fauces, soft palate, uvula and posterior pharyngeal wall, with swelling of the tonsil and follicular tonsillitis also a slight enlargement of the sub-maxillary glands. This is also the picture of a beginning tonsillitis and mistakes in diagnosis are frequently made. In a more severe case of scarlet fever we have a yellow membrane on the tonsil and fauces, and spreading rapidly, may invade the nasopharynx, the nose, and the larynx. We call this a membranous angina and it is apt to occur from the third to the sixth day. When a membrane appears later it is usually a true diphtheria to which scarlet fever convalescents are very susceptible. A still more severe type shows an acute septic pharyngitis and laryngitis and causes rapid destruction and sloughing of the structures in the pharynx and nose, profuse nasal discharge and destructive purulent otitis media. The sub-maxillary region is swollen and there maybe a diffuse cellulitis spreading down the neck. This severe process usually causes death between the seventh and tenth day, generally from the profound toxemia.

Many pediatricians believe that the degree of throat infection seems to depend largely upon the presence or absence of enlarged or diseased tonsils and adenoids and throat surgeons have been requested to perform tonsillectomy during the height of the scarlet fever reaction claiming immediate relief of distressing throat symptoms besides the avoidance of ear complications without endangering the life of their patient. This drastic procedure has never been attempted in Kentucky as far as I know and in my opinion is very dangerous and should not be carried out until the throat symptoms have subsided.

With such extensive pathology in the throat and more especially in the presence of large

tonsils and adenoids and a positive culture of the streptococcus hemolyticus in ninety-five per cent of these cases, it is easy to understand how infection can travel to the ear through the eustachian tube; in fact, it is remarkable that the ear ever escapes. The following pathological changes take place:—the mucosa in the tube swells which renders it impassable, the swelling rapidly spreads to the lining of the middle ear spaces and soon the tympanic cavity, attic, antrum and often the pneumatic cells of the mastoid process are filled with a viscid or hemorrhagic exudate. The process may stop here, the inflammation subsiding and the mucus exudate in the ear absorbed but mild inflammatory changes in the middle ear though frequent in measles are rare in scarlet fever. Usually within a few hours the exudate increases rapidly and soon becomes purulent and, unless the drum has been incised, will eventually perforate the drum membrane and pus appears in the external meatus.

If the inflammatory changes in the ear are not so severe and especially if early myringotomy has been done, the symptoms will be quickly relieved and in about one week, the discharge becomes less; mucus will be mixed with pus which gradually causes the discharge from the ear to become more stringy until it finally stops and the opening in the ear closes with the return of the hearing to normal.

Unfortunately there is still more severe types of ear infection which otologists of twenty and twenty-five years ago met with rather frequently and some of the older text books described it as the typical picture of a scarlatinal otitis. This variety is called Otitis Media Necrotica and occurred in extremely virulent epidemics especially in very young and poorly nourished children in institutions and in neglected cases. Many years ago diphtheria was often an added infection to scarlet fever and of course the combination of these two diseases caused considerable destruction and had a very high mortality.

In Otitis Media Necrotica the purulent process advances to the deeper parts and involves the bone, the folds of mucus membrane and ligaments in the tympanic cavity, also the ossicles are partly or completely destroyed, the drum membrane seems to melt away, the discharge has a very foul odor and there is constant danger of the process extending to the mastoid bone, inner ear and endocranium.

Great stress was made by older writers on the drum membrane rapidly sloughing away but otologists of the present time rarely see this severe variety and the drum membrane and ossicles are destroyed only in neglected and chronic cases.

The symptoms of a scarlatinal otitis are the

same as the symptoms of any acute infection of the middle ear namely:—a sensation of fullness in the ear, impairment of hearing, a sudden and sometimes violent earache with a rise in temperature. Occasionally the temperature may be as high as 104 degrees and there may be vomiting and a chill. There may be many variations from these symptoms and we must remember that some patients are either too young or too sick from the toxemia of the disease to complain of the ear trouble and it is apt to be overlooked. Also we must bear in mind that symptomless ear discharge may be the first indication of an otitis because the ear drum in children ruptures easily and readily and the period of pain may be very short.

We must also remember that, at any time during the desquamation stage after the fever has subsided, the patient may have a rise in temperature with only slight ear discomfort which may escape notice until the ear condition has progressed too far.

It is here that I wish to emphasize the three most important points which I hope to bring out in this paper: 1. The importance of daily inspection of the ears during the entire course of scarlet fever and not to depend upon the patient complaining of earache.

2. In dealing with otitis complicating scarlet fever, it is dangerous to be too conservative and pediatricians and otologists are of one accord as to the value of early and if necessary repeated myringotomy to lessen the seriousness of the ear complications. Whether this is done under local or light general anaesthesia is a matter of choice, but a free opening in the drum must be made and strict aseptic precautions must be carried out at the time and following the myringotomy.

3. The importance of the after treatment given to the patient, so that there will always be a free evacuation of the purulent secretion. This is accomplished by frequent ear irrigations and if necessary repeated incisions in the ear drum.

I stated previously in this paper, the symptoms will disappear or be relieved shortly after the ear drum ruptures or is incised but often the temperature may persist for two or three days, and we are in doubt as to the probability of mastoid involvement.

Statistics fail to show accurately how often the mastoid operation has to be performed following scarlet fever and in some cases it is not easy for the otologist to decide whether or not to open the mastoid because we know that there may be considerable involvement of the mastoid cells without much temperature or local symptoms and it is very necessary to operate early in order to check the destructive process as well as to prevent a chronic mastoiditis. A blood count helps us to de-

cide and an x-ray picture will often be of great assistance in making a correct diagnosis but sometimes we have to depend almost entirely upon our experience and judgment, but we know that, in dealing with a scarlatinal otitis and symptoms or signs of mastoiditis it is exposing the patient to the great danger of a lateral sinus thrombosis or some intra-cranial complication if we postpone the operation too long.

Reference has already been made to the extreme type of scarlatinal otitis which we term Otitis Media Necrotica. In this variety there is always a possibility of the destructive process extending to the inner ear and even the endocranium, causing meningitis. In such an extreme case the entire membranous and even the bony labyrinth, also the cochlea and endings of the auditory nerve may be destroyed; total deafness setting in early and if both ears are affected and unless some remnants of the cochlea remains, the deafness will persist and in young children, who have never learned to talk, result in deafmutism.

The symptoms of inner ear involvement usually occur in the late stages of the otitis and consists of a sudden considerable impairment of hearing, violent vertigo with spontaneous nystagmus, disturbances of equilibrium and vomiting.

Even if the process does not cause acute mastoiditis or involve the inner ear, the damage to the structures and hearing function has been so great that repair cannot take place and a chronic suppuration of the middle ear is the result. Fifteen to twenty per cent of chronic middle ear diseases are traceable to scarlet fever and here we have often a large perforation of the drum, granulation of the tympanic cavity, adhesions and cicatrization in the folds and ligaments, ossicles partly destroyed, a chronic inflammation of the mastoid and a foul smelling discharge with the possibility, at any time, of an acute exacerbation and the danger of some intra-cranial complication.

We have in these cases the problem of deciding whether or not to perform the radical mastoid operation but there are no definite indications for this operation and each case must be decided on its own merits.

We know that any patient with a chronic middle ear suppuration is potentially in danger of his life and most life insurance companies regard such persons as bad risks and either will not accept them at all or only as sub-standard cases. A patient may live for many years with ear discharge but there is always the possibility of a sudden flareup of the infection, and the likelihood of some serious complication.

Treatment: So far as I am able to determine, there is no method of treating scarlet

fever which will always prevent the occurrence of otitis, but I do want to mention a procedure, in order to condemn it, which is recommended in some books; that is, the nasal douche. I believe that harm is done to patients by forcibly irrigating the nose and they are more apt to develop ear trouble. I do recommend the use of ephedrine to relieve the congestion of the nose and to follow this with some silver preparation.

In a severe throat infection described previously as a membranous angina it has been my experience that frequent hot throat irrigations are of great benefit although some of our little patients are too sick to carry out this measure.

CONCLUSION

1. Statistical evidence that scarlet fever antitoxin has prevented ear complications is not convincing.

2. Children with hypertrophied or diseased tonsils and adenoids are more apt to have ear complications.

3. The prognosis of scarlatinal otitis is usually favorable if promptly diagnosed and properly treated but it is rightly dreaded on account of the possibility of rapid destruction of tissue, the frequency of permanent changes in the ear and the early spreading to the mastoid, the inner ear and the meninges.

A PRACTICAL DEMONSTRATION FOR THE CONTROL OF SCARLET FEVER*

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The scientific developments in relation to scarlet fever during the last six years, have resulted in a new conception of this disease and its control.

With the production of experimental scarlet fever in human beings it was possible to demonstrate that a specific hemolytic streptococcus was the cause of this disease. With this knowledge, the demonstration of a true soluble toxin, elaborated by these organisms and specific for scarlet fever, followed. In turn it became clear that in most instances this streptococcus does not invade the blood stream but remains localized in the throat, where it causes the angina, and in addition produces a toxin, the absorption and circulation of which gives rise to the constitutional reaction, the characteristic rash resulting from the action of the toxin on the walls of the skin capillaries.

The discovery of the specific toxin for scarlet fever enabled the development of:

(1) A skin test to determine whether an individual is susceptible or immune to scarlet fever.

(2) A method of actively immunizing

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susceptible persons against scarlet fever, so that their skin test becomes negative and they do not contract the disease on exposure.

(3) An antitoxin specific for scarlet fever.

(4) A method of differentiating scarlet fever streptococci from other hemolytic streptococci.

The discovery of a specific hemolytic streptococcus as the cause of scarlet fever, with its localization in the nasopharynx, enabled the development of a method of detecting infected individuals and carriers, by means of nose and throat cultures on blood agar plates. The application of this procedure has demonstrated:

(1) The presence of a high percentage of carriers in any group where scarlet fever is prevalent.

(2) That scarlet fever can occur without a recognizable rash, and in fact that a majority of cases are of this type.

(3) That herein lies a practical and effective method by which isolation and quarantine of cases and carriers, and release from same, can be carried out.

The demonstration of a local blanching of the scarlatinal rash about the site of an intradermal injection of either convalescent serum or scarlet fever antitoxin (Schultz-Charlton reaction) has proved an important confirmatory test in the differential diagnosis of this disease.

Application of the above knowledge constitutes a scientific means of effectively controlling scarlet fever.

In March of this year an epidemic of scarlet fever occurred at Berea College, Berea, Kentucky. At first this was thought to be an outbreak of septic sore throat. However, the taking of nose and throat cultures on blood agar plates, together with the blanching test and the epidemiological and clinical findings, gave clear evidence that we were dealing with scarlet fever.

During February and the early part of March, 12 cases of scarlet fever were admitted to the college hospital. In all probability these were contact infections. The sudden appearance of 94 cases March 12, with 80, 58, 60 and 29 the following days respectively and then a sudden drop to an average of 4 cases a day for the following week, strongly suggested the occurrence of a milk borne outbreak superimposed upon contact infection. This appeared all the more evident when it was learned that practically all of the cases which developed between March 12 and 16 had been eating at one of the two boarding halls, maintained for the students. Although the exact source was never determined, it seems reasonable to conclude that milk had been contaminated after reaching the hall by either an

unrecognized case or carrier. A probable clew to such a source was indicated upon finding several of the waiters in the hall, carriers of hemolytic streptococci.

Confronted then with a widespread outbreak of scarlet fever, the problem presented itself as to how it could be most effectively controlled. Up until this time we had been accustomed here in Kentucky, as is the case in so many places, to depend almost wholly on quarantine and isolation, realizing all the while, however, that such control measures were wholly inadequate. At the time we had a limited knowledge of active and passive immunization against this disease, but we were quite unconvinced of its efficacy.

At any rate it was recognized that here was a situation demanding the best advice available. In this connection we were most fortunate in securing the services of Doctor Gladys H. Dick, of Chicago, who came to Berea and advised and assisted us in carrying out a modern, scientific program in the control of scarlet fever, based on the application of the above mentioned scientific knowledge.

In outlining a plan of action various procedures were discussed and of course considered in the light of local conditions. A number of practical difficulties presented themselves. The college dairy is largely run by students; the dining halls and kitchens are maintained through student help; Boone Tavern, a modern hostelry, conducted by the school and well patronized by the traveling public, employs little help outside the student body; students also conduct a bakery, which serves the public as well as the school; because of the boarding hall situation large aggregations could not be prevented; a small percentage of the school population lived off the campus.

Among the more important questions which naturally arose were the following: Should the school be closed? This was deemed irrational because of the danger of spreading infection when the students returned to their homes. Should classes be discontinued for a time? No purpose was seen in this since aggregation in dormitories and dining halls could not be avoided. Furthermore, it was felt that students would be under better observation and control in their usual activities. Should Boone Tavern and the bakery be closed? Certainly this should have been done had it not been possible to do skin tests to determine susceptibles and take nose and throat cultures to determine carriers and infected individuals. However, with the carrying out of these measures, thus enabling us to employ immune persons who were not carriers, in these places, it was felt that they could be kept open without constituting a potential danger to the public. The same pro-

cedures were carried out among the workers in the dairy, dining halls and kitchens. Should passive immunization of all susceptibles with scarlet fever antitoxin be carried out? It was recognized that this would promptly check the epidemic temporarily, but with such immunity disappearing in the course of ten days or two weeks, at the end of that time we would be in essentially the same position as we started, with the prospect of the epidemic lighting up again through contact of susceptibles with the large number of "carriers" which it was anticipated would inevitably be present among the student body. Also the susceptible group would be sensitized to serum. What objection is there to passive immunization for immediate control, followed in due time by active immunization for more permanent protection? This might be looked upon as quite the ideal plan, however, certain drawbacks and disadvantages are recognized. First, there is the added expense and in most instances an unnecessary expense since in a large majority of susceptible individuals, protection would result from active immunization before infection took place. Second, sensitization to serum would result, and third, there is always the difficulty of carrying out both procedures, as there is no assurance that the persons concerned will report for active immunization after being passively immunized and hence the opportunity of conferring a more lasting immunity may be lost. In case the skin test is positive, indicating susceptibility to scarlet fever and the nose and throat culture is positive for hemolytic streptococci, indicating potential infection, then prophylactic antitoxin should be given immediately and followed in due time by active immunization, however, where nose and throat cultures are negative, antitoxin does not seem justified.

After due consideration of all aspects of our problem, the following general program of control was decided upon:

- (1) Isolation of all cases, either in the college hospital or in dormitories set aside for that purpose.

- (2) Campus quarantine of all persons connected with the college, based on the results of nose and throat cultures taken on blood agar plates.

- (3) Skin test (Dick Test) on all persons connected with the college to detect susceptibles to scarlet fever.

- (4) Active immunization of susceptible person with five graduated doses of scarlet fever toxin.

Skin tests were done and nose and throat cultures taken on the entire population at Berea College, both procedures being carried out at the same time. A practical demonstration of the set up that was used and the

methods employed will be carried out at the close of this paper.

CULTURES

Nose and throat cultures were taken on 2,232 persons, 834 or a little over 37 per cent of whom were positive. Of these 2,232 persons, 350 were cases of scarlet fever, all of whom had positive cultures; 1,380 were immune individuals as indicated by a negative skin test, 26 per cent having positive cultures, and 502 were susceptible individuals as indicated by a positive skin test, a little over 25 per cent of whom had positive cultures. From these figures we note that the percentage of positive cultures among susceptible persons was essentially the same as among immune persons. Both of these groups constituted carriers. However, in the former we were dealing with susceptible persons who were potentially infected, and thus might be expected to contract the disease. Whether or not this happens, according to Doctor Dick, depends on the balance between the immunity of the individual and the dosage of the organism present. As will be pointed out later, positive skin tests vary in size and degree of redness depending on the degree of susceptibility. That is, some persons may have a slightly positive reaction indicating considerable immunity while others have a marked reaction indicating very little immunity. Therefore, whether a susceptible person with scarlet fever streptococci in the throat develops scarlet fever or not depends on whether or not the dosage present is sufficient to overcome the immunity present.

As a matter of fact but 54 cases developed among this group, subsequent to skin testing and culturing, while 9 cases developed among the group that had positive skin tests and negative cultures at the time of first culturing.

Because of the rush of work, cultures were not checked against skin tests in time to give prophylactic antitoxin to this group of 132 persons with positive skin tests and positive cultures, as was indicated earlier, should have been done. Had this been carried out, the 54 cases developing in this group could in all probability, have been prevented.

We hear considerable about the normal throat harboring hemolytic streptococci. To check the results at Berea against a control group, the students and faculty at Eastern State Normal School at Richmond, Kentucky, were cultured. A few sporadic cases of scarlet fever had been reported from the city of Richmond but none from among the college students. These students have essentially the same background and age distribution as those of Berea College. Of a total of 786 cultures, but 47, or 6 per cent were positive.

The taking of cultures on everyone con-

nected with Berea College, resulted first, in finding a large number of carriers and second, in demonstrating that scarlet fever occurs in a majority of instances without a recognizable rash, cases which, if cultures were not taken, would frequently be missed even in the presence of an epidemic and invariably be missed where they occurred sporadically. Of the 414 cases of scarlet fever which occurred at Berea, but 83 or a little over 20 per cent had a recognizable rash.

Aside from its scientific importance, the taking of nose and throat cultures is of great practical value in providing a rational basis for isolation. Ordinarily all infected individuals and carriers would be quarantined, and isolated from susceptible persons, but in view of the circumstances at Berea College this was not feasible, since the facilities for isolation were limited. Furthermore, with all of the carriers, together with the cases out of school, continuance of classes would not have been justified. It was finally decided to keep all cases of scarlet fever isolated in the hospital or dormitories provided for that purpose and to quarantine all carriers to the college campus, release from such isolation or quarantine being based on obtaining one negative nose and throat culture. Cultures were taken once a week, it being considered not worth while to take them oftener than this. In some instances the cultures from carriers became negative in one week, a majority clearing in 3 weeks. In practically all carriers failing to clear in 4 or 5 weeks, pathology was found, either in the nose, throat or sinuses. Among the cases of scarlet fever, very few cultures became negative in less than 4 weeks, while some remained positive for 5 or 6 weeks. These findings justify the 28 day quarantine for cases of this disease. Nothing in the way of treatment has been found efficacious in curing the carrier condition. Fresh air and sunshine seem to be most helpful.

SKIN TESTS (Dick Test).

Skin tests were done on every person connected with Berea College. The many errors that ordinarily attend these tests in the hands of unskilled persons, were repeatedly pointed out by Doctor Dick. She further pointed out that until the need of accuracy in testing and reading the test is understood and a standard technique followed, the value of any series of tests will be questionable.

The toxin used for the skin test as well as the immunizing toxin should be very carefully prepared and standardized. Only those preparations licensed by the Scarlet Fever Committee can be depended upon. All alkalies, acids and alcohol must be avoided in the sterilization of syringes and needles and

there must be no free alcohol on the skin at the time of the test, since these substances cause precipitation of the toxin. Syringes and needles should be boiled if possible in distilled water. A fresh needle should be used on every patient to avoid possible transmission of infection.

The importance of special syringes and needles for this test is emphasized by Doctor Dick. An ordinary hypodermic syringe will not permit sufficient accuracy in measuring the dosage and upon applying pressure sufficient to make an intradermal injection in most people, there will be leakage around the shank.

A 1cc, Schick test syringe with slender barrel and blue plunger and plainly marked in 0.1cc graduations and a 26 gauge, 5-8 inch, soft metal shank needle, were used at Berea and are considered best for this work. The soft shank needles can be forced tightly enough onto tip of syringe to prevent all leakage. Each time the needle is changed, care should be taken to expel all water by ejecting 0.1cc of toxin. This is an important step and failure to do this explains many errors in testing.

The test is made by injecting intradermally, exactly 0.1cc of skin test solution on the flexor surface of the forearm at the junction of the upper and middle thirds. If the skin test toxin is properly prepared, it contains so little foreign protein that pseudo-reactions are practically eliminated and a control test is not necessary or advisable.

At times ecchymosis or bruising of the tissue results, interfering with reading, so that the test was run on both forearms of every person. Great care is necessary to make the injection intradermal. If the injection is deeper than intradermal no reading can be made. If the needle goes too deep it must be withdrawn and reinserted at another site and not continued up again between the skin layers. If this is done some leakage will occur into the subcutaneous tissues. The best method is to hold the syringe at right angles to the forearm with needle tangent to the skin, holding skin taut with the other hand. Inserting needle in this way one is less apt to go too deep.

The reactions should be read in a bright light, 22 to 24 hours after the test is made. The faintest reddening, 1cm or over in any diameter, constitutes a positive reaction and indicates some degree of susceptibility to scarlet fever. The extent and intensity of the reaction is in direct relation to the degree of susceptibility. A common error in interpreting this reaction is to call a slightly positive test, negative.

Reactions may vary from a faint pink blush to an intense bright red, and from 1 to

5 cm in diameter. There may be some swelling associated with the more positive reactions. This is a superficial inflammatory edema of the skin rather than a subcutaneous induration which is characteristic of the Schick test. A positive test can be made to appear negative by drawing the skin taut or by constriction above site of test. Therefore, tight sleeves must be loosened before the reading is made, and the skin of the forearm should be relaxed by pushing up a little on the skin at the wrist. Slight rubbing of the area often brings out the color better and makes the test easier to read.

Of 2,308 persons tested at Berea, 502 or 21.7 per cent were positive. Immunity to scarlet fever will vary according to age and previous exposures to this disease. This was shown very clearly in this study. Among the 2,308 individuals tested there were 37 faculty children of pre-school age, 137 training school children ranging in ages from 6 to 14 years and 2,134 adults including students, faculty, faculty wives, nurses, industrial emergency workers, and a few outsiders. Of the 37 faculty children, 34 or nearly 92 per cent were positive, of the 137 training school children, 84 or a little over 60 per cent were susceptible, while of the 2,134 adults, only 18 per cent were positive. Of course the latter group included the 350 cases of scarlet fever all of whom had negative skin test at the time of testing, immunity having been conferred by the disease. The inclusion of this group brings the percentage of susceptibles among adults to nearly 34 per cent at the time the epidemic occurred.

The results of skin testing at Eastern State Normal School showed that of 786 adults tested, 208 or 25.5 per cent were positive.

Experience in this epidemic showed the Dick test to be a definite and reliable clinical test to determine immunity and susceptibility to scarlet fever. While 63 cases of scarlet fever developed in persons with positive skin tests before immunization was completed, no cases occurred in persons with negative tests. Furthermore, all individuals who were convalescing from scarlet fever had negative skin tests. The mild sore throats in this epidemic conferred immunity as well as the typical cases of scarlet fever with rash, as shown by skin tests.

ACTIVE IMMUNIZATION OF SUSCEPTIBLE PERSONS

Immediately upon reading the skin tests, active immunization was started on all susceptibles.

The toxin used in this series was Squibbs No. 10461. It was given in graduated doses as follows:

A first dose of 500 skin test doses of toxin.

A second dose of 2,000 skin test doses,

A third dose of 8,000 skin test doses,

A fourth dose of 25,000 skin test doses,

A fifth dose of 80,000 skin test doses.

This is the dosage recommended by the Scarlet Fever Committee. It is graduated so as to give no harmful reaction, yet confer adequate immunity. When the toxin is properly prepared it contains a minimum amount of foreign proteins and no horse or other animal serum.

The first few doses were given at five day intervals since it was desired to confer immunity as rapidly as possible in face of the epidemic. After the third dose no new cases developed so the interval was increased to seven days which is considered optimal. The toxin is given subcutaneously. Accuracy in measuring the dosage and care in administration, so as to prevent leakage, are essential to success.

Of the 502 persons with positive skin tests, 477 were given the complete series of 5 doses.

Active immunization of all susceptibles brought this epidemic under complete control within 7 days or the time necessary for giving two doses of toxin. Of the 63 cases of scarlet fever which developed subsequent to skin testing, 59 developed before the second dose of toxin had been given, and the remaining 4 before the third dose was administered. All of these cases were extremely mild except one which contracted a middle ear infection as a complication. These results corroborate the statement of Doctor Dick that some immunity develops even after the first dose, progressively increasing with each succeeding dose.

The question is always asked as to the duration of immunity following active immunization with scarlet fever toxin. Experience to date indicates that this immunity is comparable in duration to that obtained with immunization against diphtheria with toxin-antitoxin.

RETESTS

It is emphasized by Doctor Dick that unless immunity is carried to the point of an entirely negative skin test, complete protection from scarlet fever cannot be expected, though the severity of any subsequent attack would be modified by the partial immunity.

Two weeks after the last dose of immunizing toxin, retests were made. One skin test dose or 0.1cc of skin test toxin was injected as before in one forearm, and two skin test doses or 0.2cc in the other. A negative reaction to one skin test dose is the criterion of immunity to scarlet fever but we were looking for a greater degree of protection than this.

Of the 481 persons retested, 467 or 97.1 per cent were negative to one skin test dose while 223 or 88 per cent were negative to two skin test doses. This represents a much higher percentage of protection than is obtained

against diphtheria with toxin-antitoxin.

The failure of a certain percentage to become completely immunized after the five dose series of toxin is, perhaps, to be explained on the same basis as the failure of the disease itself to confer complete protection in a small percentage of individuals, namely, a deficient immunity mechanism.

A sixth dose of 90,000 skin test doses was given to all who were positive to two skin test doses. This group was not retested as the sixth dose was given just before the end of the school year.

REACTIONS FOLLOWING IMMUNIZING TOXIN

While practically all of the persons immunized had more or less local reaction following each injection of toxin, a majority had no other disturbances. No necrosis, sloughs, or secondary infections occurred, nor did any harmful effects on the kidneys result, as determined by examination of the urine. The most severe general reactions consisted of general malaise, nausea and vomiting of short duration and various degrees of joint stiffness and soreness, all recovering with no ill after effects. The severity of the reaction was directly related to the degree of susceptibility as indicated by the size and intensity of the skin test reaction.

OTHER SCARLET FEVER STUDIES TO BE REPORTED LATER

On May 7, the State Board of Health was notified of an outbreak of puerperal sepsis in one of the hospitals in Lexington, Kentucky. A thorough investigation of this situation disclosed the prevalence of scarlet fever at this institution and all evidence obtained definitely indicated that the cases of puerperal sepsis were of scarlet fever origin.

In view of these findings a control program, similar to that at Berea, was carried out.

On May 23, representatives of the State Board of Health, reported at Clay, Webster County, Kentucky, to assist the local physicians and local board of health in controlling a widespread outbreak of scarlet fever in this community. Again, we were most fortunate in obtaining the services of Doctor Gladys H. Dick, and again, essentially the same program which was carried out at Berea was instituted here. However, an additional interest presented itself in this study in that an immunization program, using a preparation known as "ricinoleated antigen" and put out by Ely Lilly and Sons, had previously been carried out by the local physicians, and yet many of those so immunized continued to develop scarlet fever.

Since these studies will be reported in detail later on, all that is desired at this time is to point out:

(1) The results obtained corroborated

those at Berea.

(2) The ricinoleated antigen not only failed to immunize, even temporarily, but in addition, its use was followed by severe reactions and gave the people a false sense of security.

CONCLUSIONS

The results reported show that an epidemic of scarlet fever can be adequately controlled, by application of the following means:

(1) Nose and throat cultures on blood agar plates to detect infected individuals and carriers, with isolation and quarantine, and release from same, based on the results of such cultures.

(2) Skin tests to detect susceptible individuals.

(3) Active immunization of all susceptibles with the 5 graduated doses of scarlet fever toxin recommended by the Scarlet Fever Committee.

(4) Retests two weeks after the 5th immunizing dose, with the administration of a 6th dose to those who still react positive to the skin test.

In the light of these findings it is unnecessary today for an individual to have scarlet fever.

DISCUSSION

J. W. Armstrong, Berea: Mr. President and Members of the State Medical Society: We are facing scarlet fever today with a bold front because of the results of the studies that have been reported here today.

I think one of the things that is most important that we must consider is the fact that scarlet fever is a specific angina caused by a specific hemolytic streptococcus in which only a small percent of cases develop a rash or an eruption. This means that if we are going to isolate and quarantine only those cases which have a rash or eruption and leave the other cases alone, we are not going to control scarlet fever.

For those who have laboratory facilities at hand the culture of nose and throat secretions on blood agar plates is a simple matter, but for the general practitioner it is more difficult. We have the method that has been developed by the State Board of Health, taking these cultures on a Loeffler diphtheria medium slant and sending them into the laboratory and there having the culture plated. This is where the general practitioner can still avail himself of this method of diagnosis. If we will make it a point to culture every contact with every case of scarlet fever, as far as possible, we will go a long way in helping to control the disease.

The next thing that needs to be emphasized, I think, that has been emphasized again and again, is the need for great care in the administration and reading of the Dick test. I used to think I knew how to do a pretty good skin test until I compared my methods with Dr. Dick. As I did

that, I soon found out my ignorance. I think if care is used by everyone the criticism that is made of the Dick test will soon disappear.

If we will remember that the skin test material or toxin is unstable in the presence of alkalines and alcohol, and if we use care in making the test exactly one-tenth of a c. c. intradermally, and if we use great care in reading the tests and trying to avoid omitting any positives and calling them negatives, we can soon eliminate all the criticism in connection with this work.

During the epidemic in Berea we did not use the antitoxin in our treatment very much because we were dealing to a very large extent, with a mild epidemic. But I think we can all agree that antitoxin is efficient in treating a case if used early, and should be used in all the serious cases. We did not wish to have any serum sensitization and serum sickness when it was not necessary. There are times when we would like to give antitoxin, or like to have the benefits of antitoxin when it seems perhaps that the patient couldn't stand it. We can remember then the convalescent serum. Serum from a patient recovered from scarlet fever can be used for this purpose. We are told that about 200 c. c. of convalescent serum is equivalent to a therapeutic dose of commercial antitoxin. I think even a smaller dose than this will sometimes turn the tide in a case where we feel that the results are going to be fatal without it. We used convalescent serum in a few cases in small doses and were very much pleased with the results.

We must all face the question of active immunization. We cannot afford to let the public go unprotected if they wish to be protected. Although we would like to have some method that would be free from reactions, we know we get reactions with typhoid immunization. We get reactions with our other immunizations. We have to expect some, but we know there are no complications following the reactions with scarlet fever immunization and we know the reactions are only temporary.

When we can assure a patient finally that he is protected against scarlet fever, having gone through all the minor difficulties of the immunization, we can assure him of something that is of real value to him. (Applause).

Leon L. Solomon, Louisville: Mr. President and Members of the Kentucky State Medical Association: I have listened with rapt attention and with much satisfaction to the reading of the papers in the symposium this morning, and feel if there were no other papers on the program that those in attendance would be amply repaid.

One by one, the death dealing infectious diseases are coming under the control of scientific medicine. Diphtheria has been robbed of its terrors and now scarlet fever bows in humble obedience.

No practitioner, with large experience, but

has likely seen malignant types of this dread disease, destroying the life of its victim, through a septic process, not to be overcome by any known method of treatment. Of all of the acute diseases involving infancy and childhood, none to me has been more terrifying than scarlet fever. I recall at this moment seeing entire families of children wiped out—three members of one family and, on another occasion, in a nearby suburb, where I was present as consultant, four children died during one epidemic.

"A Practical Demonstration for the Control of Scarlet Fever," such as we have heard described this morning by Dr. Jones, attache of the State Board of Health, is indeed inspiring.

In his paper on "Ear Complications in Scarlet Fever," Dr. Peabody refers to the part played by the tonsil, expressing himself as fearful of the removal of this organ during the acute inflammatory stage. From the published reports by Dr. Place, of the South Department, Boston General Hospital, some years ago, of surgery of the acute tonsil, I was led to believe that there was less reason for fear than had heretofore existed. First with some fear and trepidation on my part, as early as 1917 I had begun to recommend the removal of tonsils, wherever and whenever the diseased organ was found.

Twelve years have since elapsed. I have seen acute tonsils in great numbers removed. I am convinced that the bugbear is not justified. The abdominal surgeon may not always select the case, on which he is to operate; he has long since been willing to invade the abdomen and remove the appendix or the gall bladder, or do another piece of major surgery, despite the fact that the organ or part is seriously involved in acute inflammatory process. I recommend and order removed diseased tonsils without waiting for the acute stage to subside.

I congratulate the society on this splendid symposium and thank the essayists for the opportunity to have heard their papers.

C. H. Harris, Louisville: I want to tell you the situation which exists in Louisville and has existed here for the past year. We have had in the city of Louisville during this last epidemic of scarlet fever about 1200 cases reported to the health office. At the present time we have 24 cases on the epidemiological board.

As I view this whole situation, it does not properly belong to the health officer employed by a municipality to control this situation. Every doctor in this state ought to be deputy health officer, and he owes it as a moral and sacred obligation to those with whom he has to deal when called in to immunize them when he knows that we have a positive way to immunize them. (Applause). When you leave this responsibility entirely to the health officer you have to remember that the health officer begins to quarrel. He has to quarrel. First, he has a quarrel with the doctor for interfering with his

business. The doctor says the usual thing that he does not like the health officer to immunize people and subtract from his income. If you believe in immunization against scarlet fever and diphtheria, then it is your duty to help secure the prevention of these diseases.

I served notice on my county society, every member of which I love and who have honored me with all the offices in that society from the president all the way down, that after the lapse of a certain length of time I was going to start a campaign of immunization against diphtheria in this city. I gave them three months to call in their people and start this immunization. At the end of three months I started. Then they called me on the carpet.

They have a right, of course, to call me on the carpet and I had a right to explain. When they did do that, I said, "If you will look at your correspondence, you will find that I notified this society three months ago I was going to do this thing. If you think you can stop me in that duty I have sworn before the high throne of heaven to perform, just get busy and stop me, that is all I can say."

As a result of that campaign we have administered from my office over 150,000 doses of toxin-antitoxin, and as a result of that we only have 20 cases of diphtheria on the epidemiological board in this city with 50,000 school children, and seven of those cases are right in one little group where I had to jail a carrier because he wouldn't obey my orders. He is now under arrest. That seems to be the sort of thing that a health officer has to have a good deal of courage to do because they look upon him as a sort of monster anyhow. The people think he interferes with their rights, and so forth. But if you men would help, if these new doctors coming on would have all this stuff, we wouldn't have half of those things to deal with; we wouldn't have half the quarreling. Health officers wouldn't be considered monsters like they are now. I know some of them think I have an ax to grind, but "Es macht nichts aus" as the Dutchman says, because I am going to do this thing if I have to do it.

We have not undertaken to immunize for scarlet fever in this city for two or three reasons. For the first reason, we have to have the consent of the parent. We have to have the guardian or parent sign a statement or agreement that we can immunize them. They very reluctantly do that for some reason. Therefore, we must depend on a campaign of education throughout the city in order to educate the parents as to the value of immunization just as we did in diphtheria.

We have had very little mortality from this great epidemic we have just gone through. I think 1.8 for 100,000 was the mortality, but the morbidity has been great, of course, and the economic loss of the thing has been great.

I, therefore, just in this brief way, want to appeal to my brother doctors. I love every one of them. I don't want to quarrel with my local brothers about this thing. In order to obviate that, I have asked for an advisory committee from Jefferson County Medical Society to consult with me. Doctors as a class ought to be teachers. We ought to teach the public the necessity for this thing, and in the teaching of it we perform our duty as best we know how. (Applause).

E. W. Montgomery, Vine Grove: In answering the health officer, of course I am a country practitioner and command a large territory. To start universal vaccination, such as this, requires an outlay by the practitioner which he cannot afford to make. I will illustrate to you a case that came up.

In the school we had a case of diphtheria. The child was sick about a week and at the end of that time the child died. Who attended the child I do not know, but the teacher at once dismissed the school and said that no pupil could come back to the school unless inoculated for diphtheria. A patient came to me who was unable to pay for this inoculation. Of course, it had to be done at once if the child was to go back to school. That throws an expense on the practitioner.

I want to ask Dr. Jones if it is better to give toxin-antitoxin for the immediate immunization in diphtheria, rather than the vaccine. I understood it the other way, that you could not get immediate immunization from the toxin-antitoxin, and that you required the diphtheria antitoxin to produce immediate immunization which would be necessary if this pupil was to go back to school.

I am illustrating this as a question of what comes up in this matter of making community immunization that way. Therefore, we have to call on the health officers for help in these conditions. (Applause).

P. F. Barbour, Louisville: Mr. Chairman and Gentlemen: I had the pleasure of introducing the Drs. Dick at the Southern Medical Association five years ago when their investigations were new. I was very much encouraged at that time by their report of the work they had accomplished and the fine diagnostic method they had perfected. Since that time, I have been heartily in sympathy with the whole method of diagnosis and of the treatment of scarlet fever by the prevention of the disease by the vaccine.

Unfortunately, my experience with the vaccine has been unpleasant to say the least. I had some patients who were made far sicker with the vaccine than they would have been with the scarlet fever itself. That, I have no doubt, was due to a fault in the preparation of the vaccine.

In talking to Dr. Dick last year, (she made a delightful talk before our medical society) she said they had found there were many little

things that came up to interfere with the value of the vaccine which they were gradually eliminating. Even so simple a matter as changing the glass in the ordinary glass bottle to a Jena glass bottle made a marvelous difference. Even as small an amount of alkali as was in the rubber stopper in these small bottles was sufficient to neutralize a certain part of the antitoxin. Those things are gradually being eliminated, and the consequence is that we are getting far less reaction from the vaccine than we used to get. I am in hopes that they will be able to work this thing out further and give us a vaccine that does not produce quite as distressing symptoms as I have seen in some of the cases I have used it in.

When we first used the diphtheria antitoxin we gave a dose thirty times the dose that is found necessary today. It may be experimenters will be able to get rid of some of the unpleasant effects of the vaccine for scarlet fever. There will be no trouble to induce people all over the city to take scarlet fever vaccine if we can do it without the annoying experience we have been having. With the present vaccine there is considerable pain and sometimes high temperature and a good deal of unpleasantness on the part of the family.

As to the treatment with the scarlet fever antitoxin, personally I have followed Dr. Jones' suggestion that in the mild cases of scarlet fever it is probably unnecessary. In any severe case of scarlet fever, certainly one would not feel like taking the risk of treating it without the scarlet fever antitoxin. (Applause).

J. E. Edwards, Lancaster: There is just one question I want to ask Dr. Jones, the advisability of giving immunizing toxin in contact cases where you have a child with scarlet fever in a large family. I understood it would be at least a few days before the test would be positive. Then would you give them the positive or the active immunizer?

Is there any contraindication in giving the toxin to a child already immuned?

J. L. Jones, Louisville, (in closing): In regard to the first question asked by Dr. Estill, I wish to state that the State Board of Health has now been licensed to make both scarlet fever skin test solution and immunizing toxin, and in the near future arrangements will be made whereby these preparations will be available to physicians and health officers, and their use urged on the same basis as active immunization is now being used against diphtheria.

At the present time scarlet fever toxin, both for skin testing and active immunization can be obtained from two companies, E. R. Squibb & Sons, and Parke, Davis & Company. The products put out by these two firms have been approved by the Scarlet Fever Committee as being reliable, and they can be obtained through the drug stores distributing the preparations of these two companies.

As regards the duration of immunity following the injection of the five graduated doses of scarlet fever toxin, experience to date indicates that this immunity is comparable in every way to that in diphtheria following the use of toxin-antitoxin. The present method of immunization has only been used for about four years now. Repeated skin tests on a large series, carried out under the supervision of the Dicks over this period of time, indicate that over 95 per cent of these individuals still retain their immunity.

In our series, we had 132 persons with positive skin tests who had scarlet fever streptococci in their throats at the time the testing was done, indicating potential infection. Fifty-four of these cases developed scarlet fever. Nine other cases with positive skin tests but whose cultures were negative, developed the disease. Of these 63 cases, 59 developed after the first dose of immunizing toxin and the remaining four after the administration of the second dose. Sixty-two of the sixty-three cases had extremely mild cases of scarlet fever, so mild that they hardly knew they were ill at all. The one case was rather severe and developed a middle ear infection as a complication, but this individual had a very marked skin test reaction indicating a high degree of susceptibility, and had only received the one dose of immunizing toxin.

It seems to me that there is nothing in these findings to indicate that the disease was made worse by giving toxin, although some were infected at the time and came down, and others developed the disease subsequent to the administration of one or two doses. In all probability a beneficial effect was received by the administration of this toxin, since as Dr. Dick points out, some immunity develops even after the first dose, progressively increasing with each subsequent dose.

The question is often asked as regards the feasibility of taking nose and throat cultures for hemolytic streptococci, in places removed from laboratories, where blood agar plates are not available. Fortunately, it has been found by the State Board of Health laboratory that cultures for hemolytic streptococci can be taken on slants of Löffler's medium the same as for diphtheria bacilli, after which they are sent into the laboratory and transferred to the blood agar plates. This procedure has been found upwards of 95 per cent as efficient in detecting hemolytic streptococci as the taking of cultures directly on blood agar plates. This offers a practical method, in the absence of blood agar plates, not only of detecting carriers but also in confirming the diagnosis in atypical cases of scarlet fever.

The use of scarlet fever antitoxin has been discussed here this morning. Reports from a number of recent investigators indicate that the use of concentrated scarlet fever antitoxin as a

therapeutic agent, rapidly relieves the toxic symptoms of the disease, shortens the course, diminishes complications, and reduces the mortality.

The unpleasant results that have been reported from the use of this antitoxin is pointed out by more recent investigators as being due to improper preparation and lack of standardization. Formally it was not concentrated and purified as is now being done. The use of the preparations that are now being made and approved by the Scarlet Fever Committee are, largely free from these unpleasant reactions.

The actual results obtained and the observations made at Berea and in other studies recently carried out here in Kentucky, where scientific knowledge was scientifically applied, prompts me to say, without hesitation, that in the proper application of this knowledge we have at our command, the armamentarium through which scarlet fever can be effectively prevented and controlled. (Applause).

JUSTICE FOR THE INSANE! ARE THE HOSPITALS FOR THE INSANE IN KENTUCKY MERE CUSTODIAL INSTITUTIONS?

By F. G. LARUE, Lexington.

Are the hospitals for the insane in Kentucky mere custodial institutions? Our answer must in a great measure be in the affirmative.

We Kentuckians are all proud of the fact that we are Kentuckians. We boast of our history, our traditions, and of our reputation for hospitality. We have never failed to donate our share for the aid of suffering humanity, yet within our own state charitable institutions there are conditions existing that should make every true Kentuckian blush with shame.

Daily we are improving living conditions for the poor, we raise money for hospitals and schools, we spend thousands upon thousands for roads without a murmur, still we have turned a deaf ear to pleas made in behalf of the inmates of our hospitals for the mentally ill.

The Eastern State Hospital, the oldest of its kind west of the Allegheny Mountains, is, in most respects, the most ill-prepared to meet the demands upon it. The first building, erected in 1817, is still in use, and with the exception of two dormitories, one for female nurses and the other for male attendants, no building has been constructed for the institution within the last thirty five years. With buildings over a hundred years old, with twice the number of beds that should be in many of the rooms, patients quartered over a boiler

room in a building that has been condemned repeatedly by the Fayette County grand jury, a situation is presented that is typical of all the institutions that care for the mentally unfortunate.

Year by year these conditions have gradually grown worse, and as these poor unfortunates cannot get to the public ear, someone else must take up their cross. The various administrations have made many promises and have done practically nothing, and their apathy is but a reflection of the indifference that exists among the voting citizenry of the state.

We are driven to a frenzy of political action by the religious conviction of some candidate or by some irrelevant and heat provoking question, fomented by politicians to catch votes,—and we turn a deaf ear upon the tragedy of our own apathy, a condition that is the shame of Kentucky.

No one is immune to the blight, which at any time may make of a most brilliant mind a hideous discord, and of a useful life a pitiful tragedy. We have confined in our institutions of this good state, ministers, lawyers, doctors, college graduates from Cornell, Purdue, Washington and Lee, University of Kentucky and many other colleges of note. No one has assurance that he will not at sometime be confined in a similar institution since we have patients from all walks of life confined in the various institutions. The condition of these unfortunate people in a majority of instances is not brought about by their own fault, and no greater obligation devolves upon the Commonwealth than to make proper provision for the care and treatment of its insane. With proper facilities and treatment many more would be restored to society as useful citizens than are, under conditions that now prevail.

Insanity is increasing at an alarming rate in Kentucky as well as other states. We are informed by the Mental Hygiene Association Bulletin that we receive in the asylums of the United States, first admissions, cases aggregating seventy-five thousand persons annually, and that one in twenty three of America's population falls victim to insanity.

We read with horror of days when maniacs were shackled and scourged, when the evil spirit was lashed out of their bodies, we boast of our modernity; and yet we see human beings who have committed no crime, whose only offense is the tragedy of a clouded brain, condemned to incarceration in antiquated fire traps where they are packed like sardines in a box.

The labors of the Board of Charities and Corrections and their superintendents can only mitigate and not relieve existing conditions in institutions that are a Hell on earth to those with enough mind left to understand

*Read before Kentucky Conference of Social Workers.

the situation—conditions which are almost as bad as those that captives in medieval dungeons had to endure. The prisoners in those damp mossy cells were not in constant danger of being burned alive, and, even when chained to the walls, were not jammed together as closely as some of the patients in our hospitals for the insane.

Instead of increasing the appropriations for the charitable institutions, they have been decreased from year to year, while the population has increased alarmingly and the cost of maintenance per capita has almost doubled. Tables showing the increase in penal and eleemosynary institution population and the fluctuation in budget appropriations by the Legislature provide interesting and instructive comparisons.

Institutional Population:

Year ending June 30, 1921.....	6,762
Year ending June 30, 1922.....	6,998
Year ending June 30, 1923.....	7,570
Year ending June 30, 1924.....	7,560
Year ending June 30, 1925.....	7,877
Year ending June 30, 1926.....	8,086
Year ending June 30, 1927.....	8,209
Year ending June 30, 1928.....	8,351
Year ending June 30, 1929.....	9,106

Budget Appropriations:

1921	\$2,114,171.18
1922	2,083,371.71
1923	1,996,688.00
1924	1,996,688.00
1925	1,786,581.77
1926	1,890,527.70
1927	1,906,099.22
1928	1,814,833.16
*1929	1,202,500.00
*1930	1,202,500.00

*The appropriations for the fiscal years 1929 and 1930 are \$1,202,500.00 plus the cash receipts. Recent regulations in the employment of convict labor and the expiration of contracts by which a large proportion of the 1928 receipts were earned, make it extremely probable that the receipts for 1929 and 1930 will be much lower than those for 1928. It is, hence, altogether likely that the sums available to the institutions in 1929 and 1930 will be lower than at any time during the period since 1921.

I am very familiar with the condition of affairs in the institutions for the insane in our state, and in position to know whereof I speak. I have in my possession recommendations made by the superintendents of these institutions, and am sure they are justifiable in making numerous recommendations that would add comfort to their patient personnel and increase very materially the low rate of recovery that now prevails. I shall not take up your time by enumerating the many recommendations that have been furnished me,

but do feel that we should mention in a brief way the most imperative.

NEEDS OF OUR INSTITUTIONS AND LEGISLATIVE RECOMMENDATIONS

Buildings: The worst obstacle that we are facing today is the over-crowded condition. There has been no addition for the accommodation of patients for thirty-five years, though the population has doubled in that time. The buildings are old, requiring constant repairs, at a big cost, to keep out the rain and cold. Their arrangement and construction belong to another era when little was known about the care of the insane. As mentioned before, the Eastern State Hospital was founded in 1817, and the original buildings have been added to from time to time without any concerted plan, the result being poorly lighted, ill-ventilated quarters for the patients. Many of them are now sleeping in corridors and rooms without an outside window.

By reason of the age, faulty and dilapidated construction of the buildings, the fire risk is enormous, and it is only by the mercy of God and eternal vigilance that such a disaster has been averted.

In our institutions today it is impossible to classify or even segregate our patients. The epileptic, the feeble-minded, the violent, the quiet, the untidy, the depressed, the senile, the young and those showing some improvement, are all crowded together into inadequate space. The latter type should be hospitalized in a separate building, and should not be housed with violently disturbed patients as this retards their recovery. We attribute our low rate of recoveries to our very crowded condition, and to the fact that those showing tendencies to recover must be kept on wards with the hopeless and violent insane. Not only should all our institutions be provided with convalescent wards, but with psychopathic or receiving wards, as well, for the accommodation of all new patients, who, after being diagnosed should be sent to the different wards of the institutions by proper classification.

In addition to the need of ward buildings, the Western State Hospital has no separate building for the housing of its male employees, and the Central State Hospital has no separate building for either male or female employees. This is indeed a very urgent need, as these employees are on duty about thirteen and a half hours a day and sleep on the wards with the patients.

Modern Hydrotherapy Equipment—Modern hydrotherapeutic equipment is needed in all our institutions. Different kinds of baths, suited to the condition of the patient, are among the best known agencies for quieting the disturbed and hastening convalescence.

Such baths take the place in modern institutions of narcotics and restraints.

Occupation and Amusement: Occupational Therapy is one of the most important factors in the modern treatment of mental cases. This work has been carried on in our institutions in poorly lighted rooms in the basement, on the wards, and in detached buildings about the grounds, but we have been compelled to convert a number of these workshops into sleeping dormitories, thereby putting out of employment several hundred patients who are now confined on the wards in a moody state of mind awaiting the inevitable. Our present amusement hall has a capacity of three hundred. It is a recognized fact that occupational therapy and amusement are two of the greatest remedial agents of today.

Farming Lands: Additional farming land is badly needed at the Eastern State Hospital. We have only one hundred and seventy-five acres in cultivation, which is not sufficient to produce garden supplies for patients and employees, and have not enough pasture land to provide adequate feed for our dairy herd. We are buying annually 29,200 gallons of sweet milk at twenty-nine cents a gallon, figuring \$8,486.00 and 17,160 gallons of buttermilk at twelve cents, \$2,059.20, and having to purchase annually \$50,000.00 worth of food supplies that could and would be produced here had we a sufficient acreage of land. Besides, farming is the most profitable of all occupations for the insane and a large per cent of our male population rendering service on the farm is rehabilitated. Even those that are hopelessly insane but have mind enough to work, are kept healthy and contented.

Surgical Sterilization: Bearing on the general problem of the insane, is the need of a compulsory law which will operate to prevent the unfit from producing their kind to the consequent detriment of society and burden to the state. This should be accomplished through surgical sterilization, and such a law, if enacted, would apply to the feeble-minded, incurable forms of insanity, and habitual criminal. It should be made to include these delinquents either now at large or in any institution supported wholly or partly by public funds. The only remedy is to cut off the source of supply by sterilization, a trivial operation, and when properly done will carry no mortality. A number of states now have this law in operation, and we trust that Kentucky will not be the last state in the union to see the wisdom of such an act.

We are face to face with a problem of vast importance, economic, social and humanitarian, and feel that you will agree with us that the appalling situation that exists in our state hospitals for the insane should be

brought to the attention of the people.

So long as these conditions prevail in our institutions, just so long our institutions will be branded as custodial. There is no logical reason why the state hospitals for the insane should not be hospitals in something more than name, and not continue, as so many of them now do, as merely large unwieldy custodial "boarding houses."

The public must be gotten away from the fatalistic and pessimistic impression of mental disorders. It must be led away from the old asylum idea and be given a vision of the hospital for mental disease. We must get away from the thought that an individual is insane or crazy, and regard him as mentally sick. We must grasp the truth that there are many types of mental diseases and that they are about as treatable as physical diseases.

Preventive measures will be a benefit to the community in lessened costs to the state, and hence in lessened taxes, in lessened crime and dependency, in better health, better efficiency, better standards of living and better morality to an extent that is incalculable.

The three elements that go to make up an efficient armamentarium of this work are money, personnel and equipment. Until such time as these three factors are forthcoming, the work must necessarily be curtailed and fall far short of the results that might be attained.

We appeal to the newspapers, to the ministers who preach the gospel of the compassionate Jesus, to the women of our good state who are always first to be touched by, and who make an effort to relieve every form of human misery, to use their influence with the coming Legislature to devise ways and means of raising money to improve the deplorable conditions in our state institutions.

He who calls himself a follower of that Man of Nazareth, who was healer of the sick, restorer of the blind; who pitied the mentally ill and made well the sick mind, whose concern was not the fortunate but the unfortunate, may not, can not but join with those who would see the condition of Kentucky's unfortunate wards bettered, and arouse Kentuckians from their sluggish indifference which is dangerously near to heartlessness.

Value of Wassermann Reaction in Milk.—In 225 puerperal women the Wassermann test was applied to the milk as well as to the blood serum. The results agreed in 95.5 per cent. In only one case did the reaction in the milk prove more accurate than in the retroplacental blood. The reaction in the milk is most pronounced from the eighth to the tenth day.

INTESTINAL OBSTRUCTION*

By M. D. GARRED, M. D., Ashland.

Acute intestinal obstruction is one of the gravest of maladies with which the surgeon is called upon to deal. This is unfortunately true in the majority of cases only because he is called upon to act late in the stages of the disease.

The most important thing in intestinal obstruction, as in any disease, is the diagnosis. This should be simple, but is made difficult only because we are not always on the alert for this condition, and when suspected, are too prone to wait for the classical symptoms to arrive, which are not symptoms of intestinal obstruction, but symptoms of approaching dissolution.

When a case presents itself in which the diagnosis is not clear, watchful waiting is too frequently prescribed, precious time is lost, and when the final state of affairs has been revealed, at operation, it is found that time has been wasted and the operation performed too late, even though the patient may yet recover.

When we have an acute abdominal condition in which we have been unable to move the bowels by simple enema, the patient complains of pain, there is vomiting (not fecal, that is too late), and a moderate amount of distention, then think of the one and only thing this can be, and operate.

Operate at once. Procrastination at this stage of the game means to deprive the patient of time, the value of which to him or her is greater than can be estimated. The life may yet be saved, but the convalescence is much longer, we are faced with bowel reaction, fœcal fistula, and semi-invalidism for the remainder of the patient's life.

It is a sad fact that the high mortality rate of intestinal obstruction is one of delay. With all our modern methods of dealing with, and knowledge of, intestinal obstruction, the time at which the operation is performed has more bearing on the mortality rate than everything else put together.

When in doubt it is much safer to operate and be rewarded by your findings, than to delay and, because of the delay, be forced into an operation where you do not have a fifty-fifty chance to save the life, let alone the future health of the patient.

The continual bearing in mind of the fact that acute intestinal obstruction is one of the greatest catastrophies that can befall a patient, will greatly reduce the mortality rate.

The pre-operative preparation must be quickly done, but nothing should be left undone that will enable the patient to better

stand the operation. One of the most important steps in the pre-operative preparation is the restoration of the blood chlorides to the normal. This will lessen the shock in every case and be an important factor in saving the life in many cases. The quickest and best method to accomplish this is to administer 2% Sodium Chloride intravenously.

At operation no more should be done than the condition of the patient will permit. The obstruction should be relieved, the bowel opened and drained. Further steps than this should depend on the condition of the patient. When there is any doubt as to whether the condition of the patient will permit resection, it is better not to resect. If the condition of the patient warranted resection, there would be no doubt. It is much better to do two, or even three, operations and have a live patient, than to do one long operation of no avail.

Our aim is to save a life, so when there has been enough done to accomplish this it is time to quit, bearing in mind that these patients are always desperately ill and that they will be shocked tremendously, due both to the condition and the operation.

In this paper it is not my purpose to go into a lengthy discussion of the operative technique. I merely wish to state that every movement of the surgeon should be definite and purposeful, using all his dexterity, speed and judgment.

The incision should be a right rectus, unless there are strong indications to the contrary. The abdomen should be quickly opened under local anesthesia and a systematic search begun for the location of the obstruction. The cœcum should be first sought. If it is collapsed, the block will be in the small intestine; if distended, the block must be in the large bowel. If this exploration is not sufficient, the pelvis should next be explored, then the hernial rings.

As soon as the point of obstruction is located, the constriction is relieved. Further steps depend upon the condition of the patient and the judgment of the surgeon.

In very desperate cases where there is extreme prostration and toxemia, relief must be afforded to the patient by the simplest and speediest procedure. No time should be lost by searching for the cause of the obstruction. The treatment indicated is emptying and draining of the acutely distended bowel. This procedure is intended as a life saving measure only, and is to be employed when circumstances dictate. The performance of an enterostomy may leave behind a condition of things from which recovery is not possible. The patient may rally from his prostration or moribund condition, yet an ensnared loop of gut, a volvulus, or an intussusception may be

*Read before the Boyd County Medical Society, October 1st, 1929.

progressing steadily towards gangrene.

The post-operative treatment should have for its aim the controlling of the shock, combating the toxemia, and the restoration of body fluids. The stomach should be thoroughly washed out, saline and glucose administered intravenously and subcutaneously. Pituitrin is very valuable in restoring the muscular tonus of the bowel and for its general effect on the circulatory system, thereby aiding in the control of the shock. The bowels should be moved as soon as conditions will permit.

CHRONIC PROSTATITIS, ETIOLOGY, SYMPTOMATOLOGY AND TREATMENT*

By JOHN W. VISHNER, M. A., M. D., Urologist,
The Welborn Hospital Clinic, Evansville,
Indiana

Urologists have known for many years that infections of the prostate gland are of frequent occurrence, but no one guessed until recently that they are as common as we now know them to be. The purpose of this paper is to call the general practitioner's attention to their importance and to give a few instructions as to the management of such cases.

I have been interested in this subject for several years, but in 1926 and 1927 I had an unusual opportunity to study this disease. At that time I was Urologist for the U. S. Veteran's Hospital at Waukesha, Wisconsin and examined, from a genito-urinary standpoint every patient who entered the hospital. Routine prostatic examination with microscopic study of the expressed secretion was made on a consecutive group of five hundred men and definite clinical and laboratory evidence of prostatic infection was found in eighty-seven or in seventeen per cent. Since that time I have seen many more patients with this disease in private practice and have become familiar with prostatitis in older men.

Our idea of the etiology of chronic prostatitis has also changed considerably in the last decade. We used to think that it was caused by the gonococcus in the great majority of cases, but we now know that at least half of these patients have never had gonorrhea. Since by no means all patients who have had gonorrhea, have chronic prostatitis, it is not fair to conclude that if a patient has had gonorrhea in the past and now has a prostatitis that the latter is of gonorrheal origin. For clinical purposes it is wisest to so infer, but one must not forget that the prostatitis may have preceded the gonorrhea or may have

begun afterwards and not be of gonorrheal origin. Perhaps the most important cause, aside from gonorrhea, is focal infection, especially infection about the rectum. I have seen a number of cases of prostatitis which were apparently secondary to long standing hemorrhoids and proctitis and am convinced that the infection extended by way of the lymphatics. Infections of the neck of the bladder that are in the beginning secondary to renal disease often cause a secondary prostatitis. Stricture of the urethra is often associated with a prostatitis, even if the stricture is not gonorrheal in origin. Other causes are coitus interruptus, masturbation, prolonged sexual excitement, horse-back riding, and driving autos and trucks over rough roads.

The symptoms of chronic prostatitis are extremely varied and often rather vague. Perhaps the most important symptom is backache, which may be in the sacral or lower lumbar region. Pain or discomfort is often found in the groins and perineum, and frequently the pain radiates down the back of the legs and closely resembles sciatica. General malaise may result from the chronic toxemia as in tonsillar or dental infections, and metastatic infections in other organs may arise from the prostate. Burning on urination frequency occurs, occasionally due to associated inflammation of the neck of the bladder. Rarely the patient complains of a glary urethral discharge, especially in the morning. This symptom indicates involvement of the posterior urethra and is more frequent in gonorrheal infections. Sexual symptoms are seldom seen in chronic prostatitis, but when present they are usually relieved when the prostatic infection improves under treatment.

A phase of this subject which is not sufficiently emphasized in the literature is the combination of early benign prostatic hypertrophy and chronic prostatitis. Caulk believes that benign prostatic hypertrophy often develops in prostates already the site of a chronic infection, and thinks that early and adequate treatment will relieve many such patients. I can confirm his findings as I have been able to completely relieve from obstructive symptoms a number of them by a course of prostatic massages.

Examination of a patient with any of the above symptoms should include a complete physical examination, including careful external examination of the kidneys, ureters, bladder, external genitalia, epididimi and prostate. Before rectal examination the urine should be passed in two glasses, at least two ounces being passed in the first glass. In prostatitis both glasses may be clear, but often

*Read before the Union County Medical Society.

the first glass is slightly cloudy and the second is clear. Rarely both glasses are cloudy, indicating the presence of a complicating cystitis. The cloudiness should be checked by the microscope to determine the presence or absence of pus.

For examination of the prostate, the patient should place his elbows on the seat of a chair, and the physician should sit on a chair or low stool behind him. The gloved finger is lubricated well and introduced as far as possible into the rectum and the seminal vesicles palpated, after which the size, shape, consistency and the degree of tenderness of the prostate are noted and some of the secretion is expressed. For this purpose each lateral lobe is firmly stroked toward the anus two or three times and then the median groove is similarly massaged. The finger is then withdrawn and a glass slide is held at the urethral meatus for a minute while the penis is hanging down, and two or three drops are collected upon it. If the secretion fails to come at once, gentle pressure should be applied over the bulbous urethra just behind the scrotum. If this also fails to bring the secretion, the penis may be grasped as one does a cow's teat and gentle pressure made upon the urethra from above downward. If this also fails, as it seldom does, it means that the secretion has gone upward into the bladder and the patient's urine should be collected at once and part of it centrifuged. If the second glass was clear just before massage and afterwards the centrifuged sediment contains pus, it means that the pus came from the prostate. Normal prostatic secretion contains numerous lecithin granules and a few granular epithelial cells, but no pus cells. If there are more than five pus cells to a high power field in the fresh specimen, a definite prostatic infection is present. The feel of the gland is often misleading, but it should not be too hard or too soft, or too large or boggy. The microscope is more reliable than the finger in the diagnosis of prostatitis.

The treatment of chronic non-tuberculous infection of the prostate consists of regular prostatic massage until the expressed secretion is free from pus, with the addition of non-specific protein therapy in selected cases. Massages should be given twice a week and should be very gentle and brief at first, but each successive treatment should be a little more vigorous and last a little longer. The patient should urinate soon after each treatment in order to wash the purulent material out of the posterior urethra. If there is a slight discharge, or if the first or second glass is cloudy, it is a good plan to fill the bladder with 1-4000 permanganate solution or with 1-1000 mercurochrome solution before massage. If the prostatitis is gonorrheal, there

may be an exacerbation of the urethritis following massage, but this can usually be easily controlled by urethral injections of five per cent neosilvol once daily.

The treatment often takes several months, especially in old gonorrheal cases. In these patients it is important to prohibit sexual intercourse and alcoholics as either of these will indefinitely postpone recovery. The symptoms usually disappear in a few weeks and the pus in from one to six months.

If the amount of pus in the secretion has not decreased considerably after a month's massage. I felt that nonspecific protein therapy is indicated. Perhaps any foreign protein may be used, but I have found Activin, a casein preparation marketed by Biscoff, to be entirely satisfactory. One cubic centimeter or more is injected intramuscularly in the deltoid or gluteal region once a week. There is moderate localized soreness for a few days afterwards. The febrile reaction commences within a few hours, and lasts until the next day, but is usually not severe. I give the injections on Saturday, and the patient is ready to return to work Monday morning. I have found that prostatic infections rapidly subside under this treatment, and the pus disappears from the secretion after from three to five injections.

It is well to have the patient return in two or three months for another examination and more treatment if the pus has returned. If this happens, a renewed search should be made for foci of infection and urethral stricture, as these may keep up the prostatic infection. Urethroscopic treatment may be required in an occasional patient, but this should be given only by one experienced in this work as much harm may be done if the treatment is not skillfully administered. If the patient co-operates, satisfactory results can be obtained in almost every case.

No discussion of this subject would be complete without mentioning some of the contra-indications to massage. We must never forget the possibility of the prostatitis being of tuberculous origin. The presence of epididimitis without history of gonorrhea, coupled with a nodular prostate and enlarged seminal vesicles, should put us on guard. The presence of tuberculous lesions elsewhere in the body would also lead to suspicion. When both of these are absent, one must depend on the feel of the gland. If it is distinctly uneven in consistency, with hard and very soft areas alternating, it had better be considered tuberculous until proven otherwise, and not treated by massage. Recent acute gonorrheal infection is also a contra-indication to massage, especially if it has been complicated by epididimitis. It is well to wait two or three months after the acute attack has subsided be-

fore massaging the prostate. Acute prostates should never be massaged, but should be treated by hot rectal douches, sitz baths and rest. Massages should not be commenced until the gland is no longer tender and then very cautiously. If at any time the prostate becomes more tender or for any other reason the patient is not doing well, it is advisable to discontinue massages for from one to four weeks, after which the massages will usually do much more good.

THE FORUM

Edgewater Coal Co. (Inc).

February 22, 1929.

To the Editor:

I desire to report to you the result I had in the use of the vaccine for prophylactic inoculation against pneumonia and influenza supplied by the State Board of Health. I inoculated about 1200 cases. No one that had received as many as three doses had any pneumonia—75% that had as many as three doses didn't have flu—the 25% that did have flu it was in a very mild form. You could notice the difference in those who only had one or two doses. I most heartily endorse same.

Yours very truly,

(Sgd.) H. M. COLEMAN, M. D.,
Surgeon for Edgewater Coal Co.
Lookout, Kentucky.

NEWS ITEM

Dr. W. O. Johnson wishes to announce the removal of his office from 522 Francis Building to Suite 907-908 Brown Building, Louisville. Hours 1 to 3 p. m. and by appointment. City 7339.

Aqueous Extract of Liver—William B. Porter, J. Powell Williams, J. C. Forbes and Hazelwood Irving, Richmond, Va., (Journal A. M. A., July 20, 1929), have been able to produce an aqueous extract of liver which is potent and remains constant when subjected to those conditions common to therapeutic material in ordinary usage. Forty-five patients having pernicious anemia have been studied to determine the effect of liver extract E. 29. The average erythrocyte increase for a period of twenty-eight days in anemia of 1.6 million per cubic millimeter or less when 90 cc. a day was used was 1.98 million per cubic millimeter. The average increase was 1.64 million per cubic millimeter with the administration of 45 cc. a day. The authors feel that patients with similar degrees of anemia require varying amounts of the effective material found in liver, and the maintenance dose must be regulated in keeping with the individual requirement.

WOMAN'S AUXILIARY NOTES

MINUTES OF THE ANNUAL MEETING

Seventh Annual Meeting of the Woman's Auxiliary to the Kentucky State Medical Association, Louisville, Kentucky, October 21-24, 1929.

Members Registered: 225.

The Woman's Auxiliary to the Kentucky State Medical Association held their Executive Board meeting Monday, October 21st at 3 p. m., at the Brown Hotel. A quorum was present. After the reading of the minutes of the previous meeting, a discussion of unfinished business was followed by the appointment of the different committees, namely: Resolutions, with Mrs. L. L. Washburn as Chairman, and Nominating, with Mrs. V. A. Stilley, Chairman.

On Tuesday, October 22nd, at ten o'clock, the general session of the Auxiliary was held in the Crystal Ball room at the Brown Hotel. The gavel, made of crab-apple wood from Crab Orchard, where the Woman's Auxiliary was organized in 1923, presented by Mrs. W. M. Martin, Harlan, last year, was used for the first time at this meeting.

In the absence of the President and Vice-President, Mrs. V. A. Stilley, Benton, Ky., presided. Mayor Harrison brought greetings and a welcome to the Auxiliary from the city of Louisville. Response was given by Mrs. R. Julian Estill, Lexington.

The presiding officer read recommendations from the President, that the conference consider the continuation of five activities already undertaken—100 per cent organization of all county Auxiliaries, Intensive work in the Study-course on Medical and Health laws, Increased contributions for the Jane Todd Crawford Memorial, Increased subscription to Hygeia, and Collection of Medical historical data.

Greetings and messages from the President, President Elect and the Secretary of the Kentucky State Medical Association were attentively received. Dr. John H. Blackburn, Bowling Green, Past President, talked at length of the appreciation of the Kentucky State Medical Association for the work being done by the Woman's Auxiliary. Dr. Hanes, Louisville, recently installed President, gave a most interesting address on "Health Habits." Dr. A. T. McCormack, Louisville, Secretary, emphasized the value of union and strength of the two organizations, working together for the cause of better Health throughout the State.

In the absence of Mrs. J. P. Boggs, Hazard, Mrs. R. L. Collins, read and discussed a paper on "What a County Auxiliary Can Do."

The Auxiliary then adjourned for a luncheon in the Ball room at the Pendennis Club, after which Mrs. J. T. Reddick, Paducah, President of the Woman's Auxiliary, introduced as the guest

speaker, Mrs. Geo. H. Hoxie, Kansas City, Mo., President of the American Medical Auxiliary. Mrs. Hoxie gave an inspiring talk on "An Opportunity for the Doctors' Wives—The Auxiliary" (resume of Mrs. Hoxie's address is appended). At six o'clock, Mrs. Irvin Abell gave a dinner at the Brown Hotel, in honor of Mrs. Geo. H. Hoxie, also the State and county officers, at which time, Mrs. Hoxie, praised the study course in Medical and Health laws undertaken by the Kentucky Auxiliary in 1929, and stated that the National organization had decided to develop similar courses, which together with reference material, will be sent to the Presidents of each State Auxiliary, during the coming year. This is to be known as the envelope plan. It is hoped that each State President will find a way to distribute this valuable material to every individual member.

On Wednesday, October 23rd at 9:30 a. m., the Woman's Auxiliary to the Kentucky Medical Association continued their meeting with reports of the State officers, Councilors, County Officers, Delegates and Committees. These were read and approved. Of especial interest was the report of the Collection of Historical data given by Mrs. Hugh N. Leavell for the Chairman, Mrs. W. F. Boggess, also the report on the progress of the Jane Todd Crawford Memorial Fund. (See appended report of treasurer).

Dr. Annie Veech, Director, Bureau of Maternal and Child Health, of the State Board of Health, illustrated some of the work being done in her department.

After her installation as President, Mrs. P. E. Blackerby, Louisville, delivered a wonderful address on "The Responsibility of Women for Good Health."

The Resolution Committee presented the following report through the Chairman, Mrs. L. L. Washburn, Benton.

Resolved that:

The Woman's Auxiliary to the Kentucky State Medical Association again pledge its allegiance to the Medical Profession and support its efforts in the supervision of the Health of the people of Kentucky through the State Board of Health.

Resolved that:

In order that the high standards of Maternal and Child Health Department, County Health Department, Tuberculosis, Dairy, Hotels and Restaurant inspection may be maintained, the present appropriation be increased by the Legislature.

Resolved that:

Contributions to the Jane Todd Crawford Memorial Fund be continued.

Resolved that:

Since the work of the Editor has grown so

great that a committee on Publication be appointed, consisting of an editor and three assistants.

Resolved that:

We hereby express our sincere thanks and appreciation to the Jefferson County Auxiliary, to the various committees contributing to our entertainment, the Luncheon, and Theater party—and to the Management of the Brown Hotel, Mayor Harrison and the Kentucky Medical Association for its many courtesies.

These Resolutions were unanimously accepted.

The nominating committee submitted the following names for officers for the ensuing year, through the Chairman, Mrs. V. A. Stilley, Benton, who moved their election, seconded by Mrs. Hugh N. Leavell. Other nominations from the floor were called for, and none being made, the nominees were unanimously elected.

Mrs. P. E. Blackerby, Louisville, President.

Mrs. E. B. Houston, Murray, President-Elect.,

Mrs. S. W. Bates, Louisville, 1st Vice-President,

Mrs. R. L. Collins, Hazard, 2nd Vice-President,

Mrs. S. P. Parks, Irvington, 3rd Vice-President,

Mrs. J. H. Parker, Corbin, 4th Vice-President,

Mrs. J. W. Sams, Crestwood, Secretary,

Mrs. W. C. Dugan, Clark, Treasurer,

Mrs. A. T. McCormack, Louisville, Parliamentarian,

Mrs. W. F. Boggess, Louisville, Historian.

At three o'clock Wednesday, the Woman's Auxiliary held an Executive Board meeting with Mrs. P. E. Blackerby, President, presiding. Plans were formulated for the ensuing year's work and Chairmen appointed as follows: Ways and Means, Mrs. R. L. Collins, Hazard; Jane Todd Crawford Memorial Fund; Mrs. A. T. McCormack, Louisville.

On Thursday a luncheon was given by Mrs. P. E. Blackerby, Louisville, at the Brown Hotel in honor of the Executive Board of the State Auxiliary, and at this time the following contributions were made to the Jane Todd Crawford Memorial Fund:

Mrs. Irvin Abell, Louisville.....	\$1.00
Mrs. G. A. Hendon, Louisville.....	1.00
Mrs. D. A. Bates, Louisville.....	1.00
Mrs. P. E. Blackerby, Louisville.....	1.25
Mrs. E. B. Houston, Murray.....	1.00
Mrs. V. A. Stilley, Benton.....	1.00
Mrs. L. L. Washburn, Benton.....	1.00
Mrs. W. C. Dugan, Clark.....	1.00
Mrs. J. T. Reddick, Paducah.....	1.00

\$9.28

HEALTH HABITS

By Granville S. Hanes, M. D., Louisville.

In addressing this Auxiliary Body I wish to say that while there may be organizations which exceed your's in point of numbers I do not hesitate to state that it has never been my privilege to speak before any society in which I have been more deeply interested. It is unfortunate for the medical profession and the people in general that you were not discovered long ago. The popularization of modern learning has qualified you to march out into the arena of an active and busy world and prove your worth and your power in shaping and directing the course of coming events.

It was only yesterday that pious, good and righteous men disdained a woman in public except with sealed lips and covered head. Of all the advances in our civilization, in every conceivable direction, none have meant so much, none have lent such an inspiration to the uplift of humanity as the liberty and freedom the women of our country now enjoy.

You are assembled here today literally engrossed in a work whereby you can assist in restoring to health those who are ill and to aid in the prevention of those who are well from becoming sick, thus making fortune supplant poverty and happiness strangle grief and despair.

It is not within the range of our comprehension to realize the colossal possibilities for good that lay within your reach. If we could all realize that there are no happenings without their causes we would place a higher estimate upon our daily conduct; the little, the trivial and apparently unimportant things we engage in frequently have significant and potent influences. We know the greatest problems and the most important events in many instances had insignificant beginnings.

As a body of comparatively new workers, dealing with others in the momentous public questions that are to confront our future civilization, let me plead with you to free yourselves from prejudices as much as may be possible. Prejudices, bigotry, self-satisfaction, adherence to traditions and senseless customs are amazing impediments to honest and honorable progress.

In referring more directly to the subject, Health Habits, I will say that if all our habits were ultra correct as relate to health we would have the major problem of life solved. Almost every step we take has more or less direct effect on health and life. The most far reaching problems in the future are to ascertain what is productive of health and then educate the populace to habitually practice these laws.

There is no such thing as one hundred per cent perfect health. It is a question of the nearness to which we approach the one hundred per cent mark. Every habit that will aid in perfecting

health helps just that much in reaching the one hundred per cent goal. This matter which we allow to concern us but little in our habitual lives to most people is, in a large majority, to most people an accident.

Practically all people are totally oblivious to the marvelous and astonishing biological structures of which they are composed. We have not turned the first page in the book of knowledge that is certain to be written for health and longevity. If three score and ten is given for the span of life when man knowingly violates the laws of health thousands and multiplied thousands of times how long will he live when he learns the truth about the laws of health, and will have sense and courage enough to execute them? In my estimation, within a few hundred thousand years from now, Mr. Methuseiah will be considered to have arrived at a suitable age to put on knee breeches.

In the past few centuries, and especially within the past few decades, man's advances in the acquisition of knowledge have exceeded human comprehension, yet, in the judgment of those who are in a position to know best, it is believed we are in the very beginning of the discoveries of the wonders concealed in nature. We have only to go back seventy-five or a hundred years and we see a total progress that exceeds the previous two or three thousand years. Our knowledge concerning nature is not obtained by dreams, fancies or imagination but by sound conclusions that are proven to be absolute facts. As time goes on man, by the aid of the various sciences, will discover new facts which in turn will assist in further revelations. All this knowledge will have its direct and indirect bearing on man's health, happiness and life. The entire process will be an approach nearer to truth and perfection.

In this forward march you will be important factors in establishing health habits. Your contact is with the world. As you become more interested in your new field of endeavor you will exert a more potent influence upon those with whom you come in contact and they will reflect their influences upon their contacts and thus the world will experience amplified pulsations from your activities.

We are living in a time of frauds and fads. They are just as much a part of progress and transition in human affairs as gravity is a property of matter. When opinions, customs and habits are passing through an evolutionary stage the populace is easily swayed. It is at this time that the unscrupulous puts forth his fraudulent propaganda. Food fads, quack and fake remedies together with cult practices play the leading role.

We do not realize what printed words mean to most people. They see it in ink on paper and that is sufficient for acceptance. Doctors do not have time and cannot afford to habitually

discuss quack medicines but in your club meetings and daily contacts with your friends by casual conversation much will be heard and heeded that you do not suspect. It takes a long time to bring a reformation and the establishment of new habits, but they all come about sooner or later. Can you hasten the process? There is no question but that you will.

Self preservation is the first law of life. The most important step in the fulfillment of that law is procuring and partaking of food. You control that situation in the home. You should become the experts of the world in the matter of the selection of food and its preparation for the table. It is said that ninety per cent of infections enter the system through the mouth. The filthy manner in which food is handled and the numerous ways of contamination make the experienced and close observer feel more and more that he would like to produce and prepare his own food. As the food question now stands we are confronted with every conceivable fad and commercialization at the expense of stomachs and health.

There is one pernicious habit which is practiced almost universally among our people and that is the mixing of every conceivable variety of foods to be eaten at the same meal. And, if one declines to partake of the concoction for fear of developing some digestive difficulties, he is advised that such fears are imaginary and if others can partake of the concoction he can do likewise. Such expressions are born of the most profound ignorance. Anyone who has ever made any study or observations as to the manner in which digestive systems react to various foods realizes that no two people can take care of foods in the same way. No digestive system is or ever will be like any other. Of course, some function so nearly alike we, in our gross manner of differentiation, can see no difference but there is a vast variation if our discernment was of sufficient acumen to recognize it. On the contrary, there are people who vary so widely in their tastes and ability to care for food one could hardly believe they had similar apparatuses for digestion. Any one can see the folly of teaching that we can all eat the same food with equally good digestive results. Numerous cases are constantly recorded where people can not eat the most simple and ordinary articles of food: as found in eggs, fish, cereals, meats, fruits, vegetables etc. Sea foods and strawberries have to their credit an unusually large number of victims. If there are foods that disagree so violently with some people is it not reasonable to suppose that there are numerous people who eat foods every day that are not taken care of by the digestive system, except in a more or less imperfect fashion? It would be an astounding revelation if we could have an open book revealing just this feature, the bearing of food on health. Again I say the problem of food out

weighs all others in matters of health, wealth and happiness.

It is appalling when we consider how individuals are punished, especially children, when they have all kinds of foods crammed into their stomachs because they have become fads. Since it was noised abroad, from some source, that spinach had iron in it, doctors, nurses and most all others, went into a frenzy about this article of food which was primarily produced by nature, in my opinion, for sheep and goats. We insist upon forcing it into the stomachs of innocent children because it is good for them. If they like and want spinach, then, let them have it, but before cramming it into every child's mouth consider for a moment how you would like a similar treatment. There are hosts of people who are forcing themselves to eat spinach and roughage, as it is termed, with certain impairment to their health. There is seldom a day in my office but some patient relates the horrible experiences he has in trying to live on roughage. These people say they continue eating roughage for the reason they have been told they could not have health without it. A very large per cent of them have defective alimentary systems and most of them take "roughage" very poorly; many are made ill by it. Man is both a carnivorous and herbivorous animal. While some thrive on roughage others thrive on meats and various concentrated food. The selection of food is an individual thing.

Let us suppose that each person, with his distinctly individual capacity for the perfect care of foods, were to eat nothing except that which was distinctly adapted to his digestive apparatus; and let us suppose every molecule, every atom, every electron and protein of food were acted upon in a perfect physiologic way, who among us would be sick, irritable and unfit for a happy life? There can be no harm if we imagine a world of people coming from such pure sources; no one can calculate its meaning.

Subjects about which little is known are handled with great liberty and freedom by the illiterate, especially. The most densely ignorant negro in the land can deliver you in heaven quicker and with greater celerity than can the most profound thinker the world has ever produced. So it is with foods. If some designing commercial octopus advertises that he will give lectures on certain dates in the parlor of a certain hotel he will usually have a hearing upon which occasion he will tell a lot about psychology of which he knows nothing and will then tell a lot about food of which he knows less.

People are saying continuously that they do not know what to eat. This is true and especially is it a fact when they have an impaired digestive apparatus. Analyses may be made, certain classes of food suggested but no one can take a long list of foods and state with very much assurance that the patient could eat a turnip and

not a carrot, or a lamb chop and not the breast of a chicken. The patient can be advised as to how he can test out certain foods, and often gain much knowledge in this way, when otherwise it would be impossible to know the foods we could best digest.

The two great forces or elements in life are heredity and environment. Many heated discussions continually arise in efforts to prove the superior influence of one over the other. They are both absolute essentials. Nothing can be more self evident than when corn is planted it does not produce clover nor when hogs are bred they do not produce cows. Neither the corn nor clover will thrive without environments that suit their needs nor will the hog or cow develop into the splendid animal within its inherited possibilities except the environments meet the requirements of the animal.

The general law controlling heredity and environment, in a broad sense, is very simple. One depends upon the other. This is amply shown in the domestication of plants and animals. As the environment, which includes everything that affects life or organic matter, meets better the physiologic requirements of the organism the better will its progeny be. The process of selecting the best to produce offspring with the superlative environments of each generation has made the pedigreed race horse, cow, chicken, etc. The same is true in all vegetable life.

The day is coming when man will not devote all his time and energies to things that are foreign to that which is good for his own life. When this is done, by the aid we will constantly gain from the various sciences, then we will see the life span utterly demolish the traditional teaching of the three score and ten limitation. Through the operation of the humanitarian principle in man he has reversed the law which he has applied to domesticated animals and plants. He has erected institutions and has protected and kept alive the sickly and poorest specimens of humankind for them to reproduce a defective progeny. Again, man will not allow the domesticated animals and plants to engage in or become surrounded by unfavorable environments while in his own case he engages in an inconceivable variety of harmful environmental influences.

Nature's laws are inexorable. They operate without regard to our wishes, habits, customs or what not in life. Man has made marvelous strides in many ways, by which he has discovered nature's laws and applied them for his good. He has not, however, made but little more than a beginning in the exploration of the hidden world of possibilities that await his future discoveries.

You will be a great power in helping to discover and establish such habits and customs as will carry mankind on to higher planes of perfection, bliss and happiness.

Resume of Mrs. Hoxie's Address

"An Opportunity for Doctors' Wives—The Auxiliary," was the subject of Mrs. Geo. H. Hoxie, Kansas City, Missouri, President of the Woman's Auxiliary to the American Medical Association, at the luncheon meeting held in the Ball room at the Pendennis Club, Tuesday October 22nd, where one hundred and eighty members and guests of the Auxiliary listened attentively to her inspiring message, which followed a most enjoyable musical program given by Miss Dora Mantle, violinist, accompanied by Mrs. Lee Moore and Miss Key Napier, musical readings, accompanied by Mrs. Marie Howans, all of Louisville.

Mrs. Hoxie stated that the outstanding opportunity for the wives of physicians is to support and encourage the humanitarian work of their husbands, who have dedicated their lives to the promotion of the Health and welfare of the people whom they serve. Through the organized work of the Auxiliary, this can be accomplished. The first requisite for intelligent work is accurate knowledge. The second requisite is unified action. The Auxiliary can and should be the training school in which, through the study of Health conditions and Public Health Administration, doctors' wives may individually make themselves efficient workers under the guidance of the Medical Society and the local Health Departments.

Justification for the existence of the Auxiliary is found in the general unsatisfactory health conditions with too much preventable disease. Two thirds of the cities of the country have infant death rates between 50 and 90. One sixth, have infant death rates below 50; one sixth over 90. If one sixth can hold the infant death rate below 50, what excuse is there for the one sixth whose infant death rate hovers around 100?

Seventy per cent of our school children have defects, preventable or remediable.

At the close of 1923 it was estimated that 20 per cent to 40 per cent of the women in confinement in the United States had no medical attendant, and 50 per cent had no medical advice or instructions during pregnancy. Some of the southern health directors estimate that 10 to 20 per cent of the births of these states are attended by ignorant mid-wives. Each year 1000 babies die under one month of age. Too marked a contrast between Health safe-guards of urban and rural population. Only about one-sixth of the 2850 counties of the United States have any Health protection, comparable to that of most cities. Over 84 per cent of our approximately 50,000,000 rural people are still without Health protection.

The proposed task of the organized Profession is Health promotion and disease prevention. Their program is possible only by more and more Public Health Education. Organization of lay women can help in this educational end of the

job. But other women's club are not doing it. Therefore the job logically falls to the doctors' wives. To help with intelligence and in such a way as to get results, women must have an understanding of the fundamentals of Public Health work. The most effective work being done by Auxiliary members is being done in those states where they are helping to carry out the programs of the State and County Health Departments, which have the approval of the Medical Profession. Such work under the direct orders of official Health workers has many sided results. It gives fresh courage to Health department workers who want the co-operation of the public. It protects the departments against the attacks of the politicians and it gives backing and support to the Health programs.

WHAT A COUNTY AUXILIARY CAN DO

Mrs. J. P. Boggs, Hazard.

We can inform ourselves along lines of sanitation, prevention of disease, health laws, etc. and pass such information along to the uninformed.

Our Auxiliary is doing this in several ways. During the months of May and June of this year we studied the nine lessons on Public Health Laws which were sent us through the U. S. P. H. S. in addition to the benefit derived from the study of this course by the individual members, we are preparing to send speakers from the Auxiliary into the County schools and pass this information along to the teachers and pupils. We think it would also be a good idea to have these same speakers appear before Women's Club meetings, P.-T. A., Business and Professional Women's Club meetings, and any other place they might be welcome and pass this information along, as "Health" is a subject everyone is, or certainly should be, interested in.

Another thing we are doing along this line is endeavoring to place "Hygeia" (splendid publication I am sure you are all familiar with) in as many schools as possible. Our "Hygeia Committee" has been very active, in as much as they have obtained 19 subscriptions so far this year, also have sold 4 copies of "Life of Pasteur" and 2 copies of "Healthyland."

During a two day meeting of Upper Kentucky River Educational Association held in Hazard during October, this Committee prepared a most attractive "Hygeia" exhibit in the high school building and, as it was viewed by 700 teachers and much interest manifested, we feel that it will be much easier to place this magazine in the rural schools the coming year.

I believe one of the greatest pleasures our Auxiliary experiences is being able to make small donations to worth while causes when called upon. I say *small*, as the only method we have to swell our treasury fund is by getting subscriptions to Hygeia and taking in new members and as our membership is comparatively

small, 25 members to date, our donations are in accord. However, we have always donated when called upon and during the past year it has been our pleasure to give

\$15.00 to State Auxiliary Treasury.

10.00 to Jane Crawford Memorial Fund and

10.00 to Kentucky Mother and Child Health Campaign.

Other Things An Auxiliary Can Do

Assist County Health Unit during clinics, school examination, etc., by helping make records and in any other way possible and if you do not have a county health unit assist your regular doctors do this work.

As many of the ladies grow beautiful flowers I think it would be a good idea to appoint a Flower Committee to provide flowers at Free Operative Clinics, Hospitals, etc.

Another service would be to

Answer home calls for the doctor in a pleasant and intelligent manner.

I think the first thing for an auxiliary to do is to get acquainted—second, study good articles which will give you understanding of your husband's work and ideas. Third, Place Hygeia in as many doctors' offices, homes and schools as you can.

By being an auxiliary member you have a greater appreciation and better understanding of the doctor's work.

PRESIDENTIAL ADDRESS

"THE RESPONSIBILITY OF WOMEN FOR GOOD HEALTH."

By Mrs. P. E. Blackerby, Louisville.

It is a gracious privilege to share in the leadership and to enjoy fellowship with those of my own sex whose lives and fortunes are inseparably linked with that profession whose achievements rank preeminent in the history of the world's progress, and whose record of service to humanity is nearly incomparable. It is my conception that our responsibility is twofold: first as women, and, secondly, as the wives and mothers of doctors.

Women are the mothers of the race and it is important for them not to suffer and sacrifice in vain. It is their nature to sense the dangers that lie along the pathway of their loved ones and to yearn for wisdom and guidance that will help them to nurture and train their children for healthy existence and useful vocation. The wife or mother is sensitive to her responsibility for accepting and applying modern health teaching in the preservation of the lives entrusted to her care, and she yields to no man in a patriotism that makes her the most responsible humanitarian of the race.

From the time of Florence Nightingale, who accepted the role of "Health Missioner" to the present day, woman has been found sponsor-

ing and encouraging movements looking to the relief of distress, the saving of human life and the promotion of good health. Some there are who have gone the way of the faddist, but in all justice to our sex, we must lay claim to credit for having assisted in securing wholesome medical and health legislation, for supporting official and voluntary health organizations and, in fact, having a full share in giving emphasis to public health as a responsibility of government. Today there are hundreds of lay organizations carrying programs relating to social and health problems and in these we find women taking a large part and accepting a full share of the responsibility.

We, of the State and National Medical Auxiliaries, are keenly aware that all of the health activities now accepted and being put into practice for public benefit, are the products of or evolutions from the science of medicine, and with just pride we should begin earnestly to have a part in sponsoring and promoting health programs, always keeping in mind the high ideals of our organized medical profession.

Medical science and public health may touch the lives of people from the conception of life to the closing chapter of existence. They play an important part in all human relations. Essential health programs deal with maternity, infant care, health supervision of pre-school and school age children, promotion of nutrition and health habits, prevention of communicable disease, home, school and community sanitation, protection of water, milk and food supplies, promotion of physical training and recreation, general health education and many other related activities.

The application of scientific facts and public health principles must be wisely applied in all health programs and doctors are the natural guides in proper procedures. It is here that our Auxiliary might find an opportunity for service. We have recourse to the American Medical Association, the State Medical Association and the State Health Department for valuable information, and each local Auxiliary might serve as a clearing house for other local civic and welfare groups. Parent-Teacher Associations, Woman's Clubs, luncheon clubs and other local agencies are carrying committees on health and social problems. These offer an opportunity for the Auxiliary to encourage programs for medical and health education by undertaking to secure for such committees attractive literature, medical and health exhibits and physicians for public addresses on special occasions.

The local Auxiliary could secure the publication of feature articles in local newspapers, such as "The History of Anesthesia," "An Historical Sketch of Pasteur and what has followed his Discoveries," "The Accomplishments of Surgery," "The Miracle of Diphtheria Preven-

tion," "What Medical Research and Animal Experimentation have wrought for Humanity." These and many other just as important subjects could be brought before the people in a way to bring enlightenment as to medical progress and to stimulate public co-operation in health programs.

The Auxiliary, of course, is behind the movement to teach the importance of an annual physical examination. This is a real opportunity for the local Auxiliary—each member should set an example before her community by adopting the annual examination policy for herself and family and maybe boast a little about it before her Auxiliary and, if the propriety of the occasion permits, in the presence of her immediate friends. Certainly the newspapers should be supplied with good publicity copy for this campaign, and where opportunity to address large gatherings on the subject is afforded, then a good speaker from the State Association or Auxiliary should be secured. *Hygeia*, the health magazine of the American Medical Association, should be in the hands of all who are interested in the education and training of the public, and we should lend our best efforts toward securing new readers for this monthly. Many local Auxiliaries are featuring subscriptions to *Hygeia*.

Our members should do everything possible to harmonize the varying interests of the medical profession. Friendly relations between doctors' families rather than open and bitter rivalry encourages public recognition of a unity of purpose within the profession to practice in accordance with its ethics and ideals. An occasional joint meeting of the Medical Society and its Women's Auxiliary will be sure to result in better professional relationships. We are proud of the profession's achievements and jealous of its reputation, and it is possible for this organization to wield an influence that will help it to its proper place in public estimation.

Only too frequently is the public regaled with vicious propaganda, emanating from groups more or less under the influence of either faddists or some new cult or sure-cure quacks, with the sole purpose of creating doubts in the minds of the people as to the value of scientific remedies and preventive health measures that have proven of definite life saving value. The ignorant, the superstitious and some of the fanatics continue their opposition to medical progress. The faddist and the cultist cry loud and long in their ignorance of the danger of modern methods of protection against smallpox, diphtheria, typhoid fever and other preventable disease. There are still other groups that prefer to suspect a lurking danger in the surgeon's art with the result that many lives are sacrificed unnecessarily because they are misled into the use of patent medicines or some other worthless remedy until it is too late. Scientific investigations are pursued and new facts and proce-

dures discovered, and published freely to the world by our doctors, who have labored without intent or hope of making capital of their achievements, but to accumulate knowledge and use their skill in service for their fellowmen. There is, therefore, the ever growing need for an intelligent understanding on the part of the people of the facts known to medical science and of the principles of modern public health practice.

The doctor—our doctor is compelled by tradition and ethics to affect a modesty that often results in delayed recognition of his contribution to human betterment. It need not follow that his home companion should hesitate to make an alliance with others of her class to acclaim the value of his professional service as the public accepts the benefits of his scientific knowledge. We share with our doctors, a pride in the traditions of their profession and we recognize the necessity for lauding their ethical standards, nor would we encourage any act that might reflect on either; but, in view of the fact that today hundreds of organizations, official and voluntary, are undertaking to broadcast for public enlightenment scientific medical and health facts that are the products of the brain and energy of the man of medicine, can not we, with unselfish aims, lift up our voices to claim for him a rightful measure of public confidence?

In the words of Robert Louis Stevenson, "The physician is the flower of our civilization, and when the stage of men is done with, and only remembered to be marveled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race."

TREASURER'S REPORT

A detailed account of the receipts and expenses of the Woman's Auxiliary to the Kentucky State Medical Association as passed by the State Auditor is to be found in the September issue of the Kentucky Medical Journal. For the benefit of those who have not seen this Journal and to refresh the minds of those who have, I will briefly outline this report.

Gross dues received.....	\$ 226.50
Less dues paid twice and.....	\$19.50
National dues.....	89.50
Total dues retained by state.....	\$ 117.50
Receipts from Hygeia.....	40.12
Contributions from counties.....	67.50
Balance from last year.....	78.29
Total net receipts.....	\$ 303.41
Southern Medical Aux. dues.....	\$21.00
Sundry expense.....	2.50
State Meeting expense.....	10.00
Stationery, stamps.....	67.86
Hygeia Commission paid county.....	5.90
Office expense.....	5.73
Balance on hand.....	\$ 190.42

Since the audit the following money has been received:

Dues, Perry County.....	\$ 5.00
Dues, Ballard County.....	2.00
Dues, Jefferson County.....	13.50
Dues, Whitley County.....	4.50
	\$ 25.00
Commission on ads in Journal.....	32.09

Balance on hand at audit.....	190.42
	\$ 247.51
C. T. Dearing Co.....	\$19.75
Delegate cards and stationery	
Mrs. Irvin Abell.....	12.50
A. M. A. Dues for dues listed above.....	32.25
Balance on hand to date.....	\$ 215.26

The paid up membership since the last meeting is as follows, listed by counties:

Jefferson	159	Trigg	2
Harlan	25	Whitley	10
Perry	21	Allen	8
Madison	19	Breckinridge	8
State at large.....	18	Franklin	8
Taylor	17	Marshall	8
McCracken	14	Carlisle	5
Graves	13	Garrard	5
Ballard	11	Oldham	5
Bell	11	Laurel	3
Calioaway	10		

The total for the 20 counties plus the 18 members of the state at large, totals 380, just 80 members more than last year.

I have been notified that the Knox County Auxiliary is to be reorganized and I trust we will hear from them at this meeting.

Christian and Daviess Counties have disorganized and I hope our membership committee will endeavour to get them back with us this year.

The Jane Todd Crawford Memorial Fund, which was started at Richmond, has amounted to \$214.78 so far to date. This money is in the First National Bank in Louisville at 4% interest.

A list of the contributors to this fund follows:

Mrs. J. T. Reddick.....	\$ 1.00
Mrs. A. T. McCormack.....	1.00
Mrs. V. A. Stilley.....	1.00
Mrs. G. L. Thompson.....	1.00
Mrs. G. A. Hendon.....	1.00
Mrs. W. G. Salisbury.....	1.00
Mrs. J. G. Foley.....	1.00
Mrs. J. H. Parker.....	1.00
Mrs. Geo. F. Fuller.....	1.00
Miss Lucy Jane Palmer.....	1.00
Miss Marie Cobb.....	1.00
Mrs. Graham Lawrence.....	1.00
Mrs. W. H. Nash.....	1.00
Mrs. A. C. Weakley.....	1.00
Mrs. W. P. Hughes.....	1.00
Mrs. C. Z. Aud.....	1.00
Miss Nancy Aud.....	1.00
Mrs. W. F. Boggess.....	1.00
Mrs. W. S. Hargrove.....	1.00
Mrs. W. M. Martin.....	2.00
Oldham Auxiliary.....	2.50
Mrs. E. R. Fitch.....	3.00
Franklin County Auxiliary.....	5.00
McCracken County Auxiliary.....	10.00
Mrs. E. W. Akins.....	10.00
Marshall County Auxiliary.....	7.00
Madison County Auxiliary.....	5.00
Perry County Auxiliary.....	10.00
Mrs. M. L. Dunn (Ashville, N. C.).....	10.00

Jefferson County Auxiliary	25.00
Mrs. G. L. Thompson.....	1.50
Mrs. Irvin Abell.....	50.00
Mrs. J. N. McCormack.....	50.00
Total	\$214.00
Interest .....	.92
	<hr/> \$214.92
Bank tax .....	.14
	<hr/> \$214.78

This account was audited by Mr. B. P. Eubanks.

A list of the counties contributing to the State Treasury in response to our appeal for funds at the last meeting is as follows:

Garrard	\$ 5.50
Perry	15.00
Madison	10.00
Jefferson	25.00
McCracken	5.00
Marshall	7.00

I wish to suggest that the county treasurer, when remitting dues send the initials of the husband of the member, as well as her maiden name. The National Auxiliary files the Auxiliary names just behind the husband's name in the American Medical Association files. Last year so many of the county lists contained only the maiden names, which is not necessary at all, and it was in some cases impossible to find out just which doctor she belonged to. I have sent both to the A. M. A. and to the Southern, as complete a list as possible.

I hope that at this meeting the question of which month to have as the beginning of the new year for all counties will be settled. There were several changes this year and it is very confusing as none of the counties chose the same month.

This, I believe, covers the financial side of the Auxiliary. On the whole it has been a good year as compared with last as far as money goes. We have a nice bank balance with which to begin the new year, and I would suggest that a part of this balance be put in a savings account at interest until some occasion comes up when the Auxiliary feels it is justified in spending it.

Respectfully submitted,

MARY PALMER SALISBURY, Treasurer,

(Mrs. W. G. Salisbury,)

Woman's Auxiliary, Kentucky State Medical Association.

A BRIEF REVIEW OF THE GROWTH OF THE WOMAN'S AUXILIARY OF THE AMERICAN MEDICAL ASSOCIATION ARE REFLECTED BY THE BOOKS OF THE NATIONAL TREASURER, 1926 to '29.

Madam President and members of the Woman's Auxiliary, Kentucky State Medical Association:

I have been asked to review briefly to you the growth of the Woman's Auxiliary of the American Medical Association as reflected by the books of the National Treasurer, which office I assumed in 1926 and relinquished in 1929. While largely statistical, I trust you will find in it something of interest and as well a certain amount of pride in the growth of the parent organization with its diversified fields of activity, which are proving so well worth while.

The bridge of information built from the knowledge garnered during our all too brief years of experience vouchsafes safe passage over dubious and devious ways for those who in the future must lead the advance.

The finances of the National body, at first meagre and difficult of acquisition, have shown a healthy and steady growth. The budget system has replaced haphazard expenditures and orderly accomplishment can be safely predicted for the future. To an organization such as ours, money is a necessary evil; the marvel of it is that with dues of but 25c the National body has been able to make its financial program conform to the limits to which such small dues restrict it.

When I entered upon the duties of National Treasurer in the spring of 1926, the following states had been organized: Pennsylvania, Georgia, Arkansas, Missouri, Virginia, Kansas, Mississippi, Colorado, Wyoming, Texas, Kentucky and Nebraska, and the respective auxiliaries had paid into the National Treasury the sum of \$598.63, a balance from which amounting to \$26.72 was turned over to me as the incoming officer.

Plans for the organization of auxiliaries to the component state medical association of the American Medical Association were outlined and prosecuted with diligence by each of the National Officers. I was assigned the task of initiating organization in Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, Rhode Island, South Carolina and Vermont; and well do I remember the correspondence. Rhode Island reported that it was too small to organize, others were not interested, in some the members of the State Medical Associations were not at all responsive; in fact the entire group with the exception of New Hampshire, Maryland and South Carolina still refuse the privileges and perquisites of membership. However, the fiscal year of 1926-1927, saw Maryland, Minnesota, New Hampshire, North

Carolina, Oklahoma and West Virginia added to the table of organization, making at the end of the year 18 states with organized auxiliaries. These had a paid up membership for that year of 6269, the dues from whom with added donations afforded an income of \$1674.71, which with the balance of \$26.72 from the preceding year, gave a total income of \$1701.43. The disbursements for the year totaled \$1663.85, leaving a balance of \$37.58.

The fiscal year of 1927-1928 saw progress in the program of organization. Alabama, Florida, Indiana, Louisiana, Michigan, New Jersey, New Mexico, South Carolina and South Dakota, being added to the list. By the end of the year 27 states, more than half in the union, had been organized, with a paid up membership of 7221. The total income for the year was \$1942.94, while the disbursements were \$402.82, leaving a balance of \$1540.12. During 1928-1929, Illinois, Iowa and Ohio, were organized, while the membership of the individual state auxiliaries showed a healthy increase in growth.

When the books were audited in May for report at the Portland Meeting, 31 states were accounted for with a paid up membership of 8946. Additional dues were received subsequent to this and well after the Portland Meeting, so that a final audit showed a total income, including the balance of \$1540.12 from preceding year, of \$3890.17. The disbursements amounted to \$3422.60, leaving a balance for my successor of \$467.57. The large expenditure for the fiscal year was occasioned by the payment of bills amounting to more than \$1400.00 contracted during the preceding year. Such an experience made apparent the wisdom of inaugurating the budget system so that disbursements for each fiscal year could be made to remain within the income for that year, consequently such a system has been instituted.

The organization had been completed in 33 states with a paid up membership of approximately 11,199. When we consider that the American Medical Association comprises 48 state Medical Associations with a membership of over 90,000, it at once becomes obvious that the growth and development of the Auxiliary has but started. A constructively organized effort is being made this year not only to organize new states, but to increase the auxiliary membership in states already organized.

The outlook for further expansion is most promising, auguring well for the furtherance of the many lines of constructive work at present being undertaken by the Auxiliary.

CARRIE HARTING ABELL, Louisville.

(Mrs. Irvin Abell).

REPORT OF THE HISTORICAL COMMITTEE OF THE WOMAN'S AUXILIARY OF THE JEFFERSON COUNTY MEDICAL SOCIETY

The work of the Historical Committee of the Woman's Auxiliary has progressed satisfactorily and pleasantly since it was formed. There is no more important work for the Auxiliary than this—none more far reaching in its results.

We need the co-operation of every Auxiliary in this state, to make a success of our undertaking, and we urge you to aid us. At present there are Auxiliaries in twenty-three counties in Kentucky. They are as follows:

Presidents of County Auxiliaries

Counties	Presidents	Places
Allen	Mrs. G. R. Keen,	Scottsville
Ballard,	Mrs. G. L. Thompson,	Wickliffe
Bell,	Mrs. C. F. Clayton,	Balkan
Breckinridge,	Mrs. S. P. Parks,	Irvington
Calloway,	Mrs. J. V. Starke,	Kirksey
Carrisle,	Mrs. R. K. Galloway,	Bardwell
Christian,	Mrs. Austin Bell,	Hopkinsville
Daviess,	Mrs. J. C. Hoover,	Owensboro
Franklin	Mrs. John P. Stewart,	Frankfort
Garrard,	Mrs. J. B. Kinnaird,	Lancaster
Graves,	Mrs. Geo. T. Fuller,	Mayfield
		219 N. 7th
Harlan,	Mrs. H. R. Bush,	Kildav
Jefferson,	Mrs. D. A. Bates,	Louisville
Laurel,	Mrs. O. D. Brock,	London
McCracken,	Mrs. J. T. Reddick,	Paducah
Madison,	Mrs. H. C. Jasper,	Richmond
Marshall,	Mrs. E. G. Thomas,	Benton,
		Route No. 1
Oldham,	Mrs. J. W. Sams,	Crestwood
Perry,	Mrs. J. P. Boggs,	Hazard
Russell,	Mrs. Ada Tartar,	Russell
		Springs
Taylor,	Mrs. Burr Atkisson,	Campbells-
		ville
Trigg,	Miss Bessie Flock,	Cadiz
Whitley,	Mrs. M. W. Steele,	Corbin

We hope by the end of this meeting of the State Medical Society as many more counties will have been added.

We want to work toward having a Medical Book of Reference of our State, of which Kentucky will be justly proud; for no State in the United States out ranks Kentucky in her Medical Lore and History so we see that each County must look after its own Medical Laurels.

Over 150 Life Sketches are on file, ready for publication—when the other Counties have sent in theirs. Thus far, only seven Counties have sent in their Medical History. Please help your Historical Committee to render unto Caesar the things that are Caesar's; and all honor to whom honor is due.

This is a great undertaking and to succeed means perfect co-operation of all the Counties and their respective Auxiliaries.

I offer the suggestion, that each succeeding Chairman of the State Historical Committee keep all the data that she gets until all the material in the state has been gathered, and that a meeting shall then be held at which all the preceding chairmen shall be present, each with her data, and that all shall collaborate in compiling a complete Medical Reference History, which shall then be published and with a printed copy in the hands of each County Auxiliary.

Respectfully submitted
MRS. W. F. BOGGESS.

SECRETARY'S REPORT

The minutes of the Richmond meeting were made ready for publication in the Kentucky Medical Journal, and as the Auxiliary voted, letters of sympathy were sent to Mr. John Wathen, Mrs. J. B. O'Connor, Mrs. Frazer, of Louisville, and Mrs. W. B. Stirman, of Owensboro. Letters of regrets for absence were sent to Mrs. Allen Bunce, of Atlanta, Georgia, president of the The American Medical Auxiliary, and to Mrs. Meredith, of Scottsville.

Mrs. Meredith and Mrs. R. L. Collins were notified of their election to offices of Vice-Presidencies by the Auxiliary.

Graves County Auxiliary won the prize in the scrap-book contest. The prize was a gavel presented by Mrs. Wm. M. Martin, Harlan, our President.

Membership cards have been sent to those whose dues are paid for 1928-1929. Cards have been made and are filed for every member on the list.

We have now 23 county Auxiliaries, Calloway county being organized in May and Graves re-organized, giving us a membership of 380 paid, 6 new ones (if I mistake not). Every county has been notified of the scrap-book exhibition which is in progress at this time and reports of the county meetings have been sent to the Journal from time to time.

A report was given to The American Medical Auxiliary, of the work being done by the Kentucky State Auxiliary, and by the State Board of Health in The Blue Ribbon contest under the direction of Dr. Annie Veech, and material was sent for the scrap-book which the American Medical Auxiliary is compiling.

Signed:

IDA B. SAMS,
Secretary.

(Mrs. J. B. Sams)

DELEGATE'S REPORT, WOMAN'S AUXILIARY, AMERICAN MEDICAL ASSOCIATION, PORTLAND, OREGON, JULY 8 to 12, 1929.

I am happy to have the opportunity to bring to you today the greetings of the Woman's Auxiliary of the American Medical Association.

I cannot begin to tell you all that is in my heart, I might attempt to tell you all the pleasures, but I could not even then express to you the Woman's Auxiliary's increasing power and strength, because of the enlarged opportunity for helpfulness. The future success of the Woman's Auxiliary to the American Medical Association is assured, since the States have shown their willingness to co-operate with the Medical Profession in every way.

One hundred and ninety delegates were present. After listening to the reports of the different States and then hearing the Kentucky State Board of Health taken as a model for all the States, my heart overflowed with joy, for I realized the Kentucky State Board of Health's task is indeed one of tremendous magnitude, requiring much labor and self-sacrifice, with the real quest in life—Service.

The copies of Study Course of Health laws sent to the different States were appreciated beyond words, and discussed with great pleasure.

Probably no field of education within the past few years has shown more progress than has that of health education. Today all over the world there is a growing demand for better health protection, and I like to think of the Woman's Auxiliary as one of the growing branches of the great tree of health knowledge.

As doctors' wives our heritage is rich in opportunity for our lives are linked with those whose success is not measured in dollars and cents, but in service to humanity. To what greater cause can we lend this influence in our lives than to the cause of good health?

It is a tremendous task to persuade 120,000,000 people to join this crusade for health. It means the mobilization of all the intelligent men and women of the nation. Let us all join hands in this lofty enterprise. Let the physicians be the teachers, their wives the messengers, our press the promoters, our clubs the salesmen and our influential men and women the capitalists.

Let us build a paved highway to health and happiness, and hope to see the cementing influence of our Auxiliary's work encircle the earth with its altruistic service.

T. Fuller said:

"He who cures a disease may be the skilfullest but he that prevents it is the safest physician."

On Tuesday, July 9th, at 9 a. m., there was a special meeting of the Executive Board and Delegates of the National Auxiliary at the Auditorium of the Couch School.

Wednesday, July 10th, 9:30 a. m. to 12:30 p. m. Annual Business Session of the National

There was a total registration of 379 ladies, including a splendid representation from Kentucky.

We had greetings from the American Medical Auxiliary given by the President, Mrs. Allen Bunce, of Atlanta, Georgia, also greetings from the Southern Medical Association given by Dr. Bathurst, of Little Rock, Ark., their President. After the roll call and report of the States, the President's address on "Jane Todd Crawford, Pioneer Heroine in Surgery" was immensely enjoyed by all. Then came the reports of the chairmen of the different committees.

Mrs. Bunce, chairman, reported the following the nomination committee:

Mrs. C. W. Garrison, Little Rock, Ark., President.

Mrs. J. N. Brawner, Atlanta, Ga., President-Elect.

Mrs. A. B. Holmes, Fairmont, N. C., First Vice-President.

Mrs. W. H. Nardin, Anderson, S. C., Second Vice-President.

Mrs. D. A. Rhinehart, Little Rock, Ark., Corresponding Secretary.

Mrs. J. W. Sams, Crestwood, Ky., Recording Secretary.

Mrs. Edward Mitchell, Memphis, Tenn., Treasurer.

Mrs. Southgate Liegh, Norfolk, Va., Parliamentarian.

Mrs. Nardin, chairman of the awards of the Scrap-book contest, presented Kentucky with the prize, saying the committee considered it a beautiful and instructive scrap-book and ask that it be used as a model. The prize is the Watch-clock, which sits on the desk. Kentucky is proud of her honors.

Mrs. K. W. Cosgrove, chairman of Resolution Committee, reported two resolutions which were unanimously adopted. The first was a request for the appointment of a committee of three members of the Southern Medical Association to act in an advisory capacity for the Auxiliary, and resulted in the appointing of Dr. E. H. Cary, Dallas, Texas; Dr. Seale Harris, Birmingham, Alabama, and Dr. Southgate Leigh, Norfolk, Virginia.

The second resolution was the approval of the suggestion that the Southern Medical Auxiliary, take as its special service the development of a memorial in recognition of the "Pioneer Heroine in Surgery, Jane Todd Crawford."

Mrs. J. W. Sams, Crestwood, Kentucky, chairman of the Courtesy Committee, expressed appreciation of the visiting ladies to the Asheville, North Carolina, ladies for their hospitality. What with teas, card parties and auto drives over the mountains to view the beautiful scenery, and, as Jack-frost had paid them a visit, the foliage on the mountain sides was unbelievable to one who has never visited in the "Land of the

Sky." The musicale at the noted Grove Park Inn was a marvelous affair as the organ there is said to be the largest and finest in the world.

Following the reports of the committees, came the installation of the new President, Mrs. C. W. Garrison, of Little Rock, Arkansas and as she gathered her newly elected officers around her, a fairy appeared bearing a huge basket of beautiful white Chrysanthemums together with a note of congratulations sent to her by her own home State Auxiliary, presented by Mrs. Wm. Leroy Dunn, of Asheville. After a gracious acknowledgement by Mrs. Garrison, came adjournment. The afternoon was given to auto drives and sight seeing with tea served in the Doctors' homes at the end of the drive and card parties were given at the hotels in the evening.

On Wednesday morning, November 14th, the Executive meeting of the Woman's Auxiliary was held at the George Vanderbilt Hotel, with Mrs. Garrison and the new officers presiding. There was a quorum present.

The following committees were appointed:

Resolutions—Mrs. E. H. Cary, Dallas, Texas.

Publicity—Mrs. J. N. Brawner, Atlanta, Ga.

Historical—Mrs. A. T. McCormack, Louisville, Ky.

Program—Left open.

Then the place of the next meeting was announced. This is Miami, Florida. A cordial invitation was extended to every one to attend the Miami meeting which is to be held November 19-23, 1929, inclusive.

MRS. J. W. SAMS, Crestwood.

REPORT OF COUNCILOR OF FIRST DISTRICT

To the President, officers and members of the Woman's Auxiliary to the Kentucky State Medical Association we beg to submit the following report for the year just closing.

Number of new organizations, one.

Number of reorganizations, one. (Accomplished by the President).

Number of meetings attended, three.

Number of talks made, nine. In each of these Hygeia, Funds for our State Treasury, Funds for Jane Todd Crawford Memorial and a plea for larger membership were presented.

Number of State at large members secured, one.

Number of histories of pioneer doctors secured, three.

Number of Presidents of Counties visited in behalf of the Auxiliary, three.

In our visits to counties in other districts we found that, Ohio, Union, Muhlenberg and possibly Hopkins, might be organized with a little outside aid.

Respectfully submitted,

MRS. V. A. STILLEY, Benton.

REPORT OF CHAIRMAN OF ORGANIZATION

Only two Auxiliaries have been organized this year. Calloway County was organized at Murray, May 7, 1929, by Mrs. V. A. Stilley. Sixteen charter members. Hardin County was organized at Elizabethtown, October 8, 1929, by Mrs. S. P. Parks and Mrs. R. T. Layman. Eight charter members, including Mrs. W. A. Pusey, Chicago, honorary member.

I have written twenty-five letters to District Councilors, trying in my feeble way to encourage organization.

I visited Glasgow, October 9th. They do not have an Auxiliary in Barren County. I am sure they are interested and will in time have a real live organization since two of the doctors' wives are members at large.

It has indeed been a great pleasure to me since my co-workers have shown such a fine spirit all through the year. So let's not be discouraged, and hope some day to see every county in the State a full fledged member.

MRS. H. M. MEREDITH, Scottsville.

WHITLEY COUNTY REPORT

The Auxiliary to the Whitley County Medical Society, Reports the Following Activities:

Eight members, two attending the Southern Medical meeting at Asheville, North Carolina. Joint meeting and lunch with the Whitley County Medical Society.

One member working with Family Service Organization was able to give information in five instances.

The Auxiliary working with all local physicians made records of the results of examinations of the school children, as to condition of Ear, Eyes, Nose, Throat, Heart, Lungs, Skin and Nervous Condition.

Since we have twenty-one hundred children enrolled, this examination was tedious and time taking.

A dental examination had to be postponed on account of sixth week examinations and so results can not be given in this report.

The Auxiliary contributed to the Jane Todd Crawford Memorial Fund.

OLDHAM COUNTY REPORT

The Oldham County Auxiliary holds their meetings annually with good attendance. Mrs. S. J. Smock, Lagrange, was the Delegate to the Richmond meeting.

Mrs. H. B. Blaydes, Lagrange, is our acting Delegate for this year at the Annual meeting. This past May, Mrs. C. L. Hancock, Lagrange, was elected President to succeed Mrs. J. W. Sams, Crestwood.

The Oldham County Auxiliary gave \$2.50 to the Jane Todd Crawford Memorial Fund. Mrs. E. F. Weeks, of Lagrange, presented us with a drawing of the Jane Todd Crawford operation.

ANNUAL REPORT WOMAN'S AUXILIARY, PERRY COUNTY MEDICAL SOCIETY

Woman's Auxiliary, Perry County Medical Society has held three regular meetings and two call meetings during the year of 1929. The Auxiliary has a membership of 25, with the following officers:

Mrs. J. P. Boggs, President,
Mrs. C. D. Snyder, First Vice-President,
Mrs. J. M. Ray, Second Vice-President,
Mrs. B. M. Brown, Secretary and Treasurer,
Mrs. B. Fitzpatrick, Chairman of Program,
Mrs. R. L. Collins, Chairman of Publicity,
Mrs. G. B. Wheeler, Parliamentarian,

Nine lessons on Public Health Education, the Study Course on Health Laws, were studied, read and discussed at the meetings and a written report on the manner in which this course was studied and benefit derived from same was sent Mrs. Hoxie, for use in National convention held at Portland, Oregon.

The Committee on Hygeia was very active during the year, eighteen Hygeia subscriptions being obtained. Four copies of the Life of Pasteur were sold and two copies of Healthyland. During the meeting of Upper Kentucky River Educational Association held in Hazard, October 10th and 11th and attended by seven hundred teachers, a most attractive Hygeia Exhibit was held at High School which attracted much attention, and it is believed that it will be a great help to the Auxiliary in placing Hygeia in the rural schools.

During the year the following donations have been made by the Auxiliary:

\$15.00 to State Auxiliary Treasury.

10.00 to Jane Todd Crawford Memorial Fund.

10.00 to Kentucky Mother and Child Campaign.

MARION COUNTY ORGANIZES

The Auxiliary to the Marion County Medical Society was organized Friday, October 18, 1929, at the home of Mrs. Thomas F. Cleaver, Lebanon, with a membership of six. The following officers were elected:

President—Mrs. Thomas F. Cleaver.

Vice-President—Mrs. J. T. Boldrick.

Secretary—Mrs. H. R. Wilber.

Treasurer—Mrs. O. M. Crenshaw.

Congratulations and all good wishes to our youngest County Unit.

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Irvin Abell..... Louisville
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Third District
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Fourth District
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Fifth District
W. E. Gardner..... Louisville

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R. C. McChord..... Lebanon

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COUNTY SOCIETY REPORTS

Third District: The last meeting for the year of the Third District Medical Society was held at the new Community Hospital, Glasgow, on Wednesday, October 9th. The meeting was called to order by Dr. Austin Bell, President.

Clinics by the Community staff of the hospital were presented.

Dr. C. C. Howard, a case of Pott's fracture with method of treatment by frequent mobilization.

Dr. C. C. Turner, discussed pellagra and presented two cases, one of these being Dr. Ferguson, who has had the condition for two years and whose discussion of the condition personally, was very interesting as to possible cause, its seasonal recurrence and as to treatment.

Dr. Fidella Edwards reported two obstetrical cases, one a sudden death following forceps delivery and the other a complicated abortion.

A most delightful luncheon was served by the Community Hospital at the noon hour.

Dr. F. M. Stites, Hopkinsville, read a paper on "The Care of the Epileptic by the Family Doctor." It was discussed by Doctors Meredith, Edwards, Adair, York, Botts, Graves and Stites.

Dr. Hoy Newman, Bowling Green, read a paper on "Hyperthyroidism in Children." This was discussed by Doctors Honaker, Howard, G. Y. Graves, Blackburn and Newman.

A rising vote of thanks was tendered the Community Hospital for their delightful entertainment, the local physicians for their splendid clinics and the essayists for the papers presented.

The Society adjourned to meet in Bowling Green in early spring of 1930, it being decided to have three meetings, one in Bowling Green, Hopkinsville and Glasgow next year.

JNO. H. BLACKBURN, Secretary.

Franklin: The regular meeting of the Society was held in the Writing Room of the Capital Hotel on July 5th, 1929.

Members present were: Dr. John Patterson, R. M. Coblin, R. B. Ginn, F. M. Travis, G. A. Budd, E. C. Roemele and L. T. Minish.

The Society was called to order by the President, Dr. John Patterson.

The minutes of the June meeting were read and approved.

Dr. G. A. Budd was in charge of the program and presented Dr. J. D. McGuire, Lexington, Ky., who had for his subject "True Auricular Fibrillation." Dr. McGuire's paper was the most practical and interesting expose of this perplexing subject we have ever heard. A general discussion followed in which most everyone present engaged and after which the Society adjourned to the Hotel Dining Room for lunch.

L. T. MINISH, Secretary.

Franklin: The Society met August 27, 1929, at 6 p. m. in the dining room of the Capital Hotel and had as our guests—Dr. J. H. Blackburn, President of the Kentucky State Medical Association, of Bowling Green, and Dr. G. S. Hanes, President-Elect of the State Association, of Louisville. Dr. A. T. McCormack, Secretary of the State Association, Louisville, Dr. C. W. Hibbett and Mr. Blackerby, also of Louisville. Drs. Tolls, Lilliard, Overall and Kavanaugh, of Lawrenceburg, Drs. McBee, Botts and Crissman, of Owenton, Dr. Bickers, of Eminence and Dr. Chapman, of Port Royal, Henry County.

Members present were: Drs. Coblin, Stewart, Patterson, Heilman, Wilson, C. T. Coleman, Jackson, Youmans, Roemele, Budd, Ginn, Travis and Minish.

Following the dinner the Society retired to the hotel ball room, where Dr. Patterson, the president, introduced Dr. McCormack, who addressed the Society and introduced Dr. Hanes, who spoke on the subject of preventive medicine. Dr. McCormack, having charge of the program, for the evening, presented Dr. Blackburn, whose subject was organization. Mr. Blackerby of the State Board of Health, also spoke on organization of the profession. Dr. Hibbett presented us with a most interesting and instructive scientific paper, which Dr. McCormack told us was a sample of what we would hear at the meeting of the State Association and urged that each one attend this year.

The Society then adjourned to meet again on October 3rd, our regular meeting date for October.

L. T. MINISH, Secretary.

Casey: At a call meeting of the Casey County Medical Society on Thursday, September 19th, 1929, the following members present: L. F. Hammonds, I. S. Wesley and Wm. J. Sweeney.

Dr. L. F. Hammonds was elected president, and Wm. J. Sweeney was elected Secretary. Dr. L. F. Hammonds was elected Delegate and Dr. Wm. J. Sweeney, Alternate to the Kentucky State Medical Association.

WM. J. SWEENEY, Secretary.

Campbell-Kenton: WHEREAS, Dr. John Robert Murnan, President of the Staff of St. Elizabeth's Hospital, Covington, Kentucky, entered into Eternal Rest on September 8th, 1929, we his fellow-members and co-workers on the Staff, deeply regret and fully sense our very great loss, and

WHEREAS, Dr. Murnan was a graduate of the Ohio Medical College, Cincinnati, Ohio, in 1884, practiced medicine in Covington and vicinity for 45 years, also a member of the Staff of St. Elizabeth's Hospital for 45 years, and President of the Staff for the last eight years. He

was a Fellow of the American College of Surgeons. Dr. Murnan spent many years of labor and energy in the development of St. Elizabeth's Hospital, and in those days of long ago wrought miracles from the commonplace materials which were at hand. It is due in no small degree, to his indomitable spirit and executive ability, striving for an ideal, that the hospital is now enjoying a place among the best institutions of the State. We, his fellow doctors know how he loved this hospital, loved it next to his home. The beautiful and valuable work he did in behalf of the hospital will ever be a memory, and his achievements recorded in the history of our hospital.

Dr. Murnan was one of life's great helpers, a skillful operator and teacher, an ideal practitioner devoted to and beloved by his many patients, a consultant whose judgment, ripened by a wealth of experience was invaluable to the younger men whom he loved to help and encourage—always bringing the best skill acquired by his long experience and study of human misery. He was greatly loved, not only by his family and friends, but by every one who came in contact with him, and his 45 years of service for mankind won the respect and admiration of the people of Covington. Covington lost a wonderful citizen.

THEREFORE, BE IT RESOLVED, by the Staff of St. Elizabeth's Hospital, who knew him and loved him, and worked for and with him, that this Resolution be spread upon our minutes, and that a copy thereof be sent to the family of Dr. John R. Murnan.

COMMITTEE ON RESOLUTIONS,

By L. C. Hafer, M. D.

By A. J. Schwertman, M. D.

Chronic Pentosuria and Migraine—Changes in diet did not appreciably affect the pentosuria in the case reported by Jacob I. Margcllis, New York (Journal A. M. A., July 20, 1929). Ingestion of amidoprime markedly increased the output of pentose in the urine in direct proportion to the amount ingested. As no such occurrence was demonstrated in more than 100 normal and sick persons (including some with glycosurias), this effect of amidopyrine may possibly be utilized as a provocative test for chronic pentosuria. Intravenous injections of a typhoid bacillus vaccine caused a markedly drop in the pentose and the nitrogen output in the urine on the same day, provided a severe general reaction took place. During this entire series of injections, there was little or no change in the average output of pentose. However, there were certain periods when the excretion of pentose was somewhat lower than had been previously present. These curiously, coincided with the periods of temporary objective clinical improvement.



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